



# INDUSTRIAL-ARTS MAGAZINE

Incorporating: **HANDICRAFT** and the **ARTS AND CRAFTS MAGAZINE**

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# INDUSTRIAL-ARTS MAGAZINE

Vol. V

JUNE, 1916

No. 6

## Primary Construction

Edward F. Worst, Director of Elementary Manual Training and  
Construction Work, Chicago

### Introduction.



HE outlines on construction work as they shall appear from month to month, are for the teacher's use. It is not intended that the suggestions contained in them shall be mechanically followed.

It is, however, intended that the teacher, in order to become familiar with the subject-matter, shall work out in detail each problem suggested for her particular grade. Not until this is done can she appreciate its value. When she has made the work a part of herself she will present it, not as some one else would direct her to do it, but in her own way.

Construction work in the primary grades, consisting largely of disconnected exercises without apparent reasons for presenting them to the children, is apt to be much less useful as an educational agency than it should be. It has failed to give that high degree of mental discipline, which, when properly presented, it is so well calculated to afford. The number work growing out of the construction work when properly taught, affords the finest mental discipline of any study in the primary grades.

The outlines will suggest work that is not only simple, progressive, and practical, but work that is adapted to the academic course, thus making it possible for the work to be taught in connection with other branches of school studies.

In no instance should material be passed to pupils and mechanical dictation be given them for the construction of a certain problem. Dictation has a value and place, but not until a necessity has been created for the exercise, followed by a class discussion as to its value and its construction.

It is not always wise to give directions verbally. The child is learning to read and to write. To give directions thru reading and writing impresses him with the fact that it is really a way he can learn from others, and adds greatly in the work of the upper grades, where the child must be able to read understandingly before he is able to perform much of his work.

Show the pupils a finished exercise made by your-

This is the first of a series of articles in which Mr. Worst will present Primary Construction Work for first, second and third grades for an entire year. The work for October will appear in our September issue.

self. This exercise should not be too difficult, and not so different from previous exercises that the child will not be able to comprehend the new step. After the exercise has been carefully examined, allow the pupils to make some like it as nearly as possible.

After the construction of a certain exercise, under the teacher's direction, have pupils repeat the exercise, doubling all dimensions. Have pupils repeat the exercise by taking half of each dimension.

Give written directions on the board, such as the following:

Draw a rectangle 4"x3".

Draw another rectangle, doubling the above dimensions.

Draw a rectangle 6"x4".

Draw another rectangle, using one-half the above dimensions.

Have the pupils, very early in the work, understand a pattern drawing. Place on the board a pattern drawing of some object to be made, asking the class to follow it.

It is well to remember that the greatest value grows out of problems suggested by the real needs of the pupils as the construction of any problem for which there is a real motive brings forth the pupil's very best efforts.

In the primary grades there should be three distinct groups of problems, those relating to the schoolroom administration, the child's play, and problems related to the home.

Under Schoolroom Administration are boxes, books, envelopes, etc. These are constructed for the purpose of taking care of the various lines of educative seat work suggested thruout the year's work.

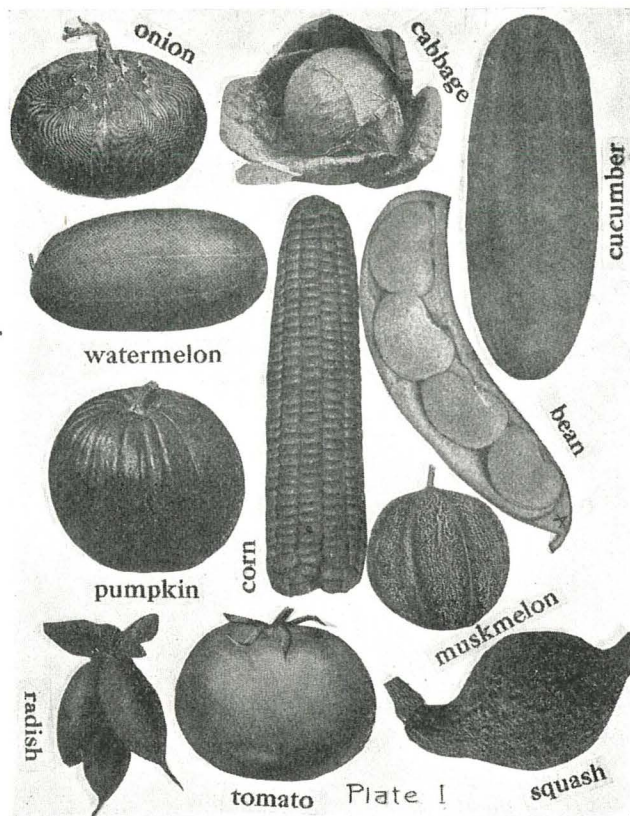
The doll house and its modification takes care of the play side.

For the home there should be an occasional exercise carried out by the pupils. This should be something appropriate for the home—a button book, needle book, stamp case, court plaster case, etc.

### Reasons for Giving Construction Work.

1. Develops control of muscles and the co-operation of mind and hand, leading to skill.





First Grade.

2. Helps to fix habits of accuracy, neatness and thinking, and doing things in an orderly way.
3. It furnishes opportunity for teaching (a) numbers, (b) language, (c) reading, (d) free expression.
  - (a) Refer to number work based on construction calling for folding into sixteen squares and the use of the ruler.
  - (b) Language: If the question, How many squares are there in one row? is asked, the answer in a complete statement, "There are four squares in one row" will lead the child into habits of proper expression. Tell about the second row; the third row.
  - (c) A new vocabulary made up of such words as "edge, square, lower, right, left, line," etc., soon grows from the work, and may be utilized in giving directions thru written sentences on the board.
  - (d) Much opportunity should be given to children to express freely in a concrete way the ideas gathered from literature and their own experiences.
4. Gives ability to follow directions.
  - (a) Thru dictation.
  - (b) Thru use of patterns.
  - (c) Leading to the making of working drawings; to reading and interpreting intelligently, and the making of blueprints in the seventh and eighth grades.
5. Training in taste. This comes thru:

- (a) Selection of materials.
- (b) Combination of colors.
- (c) Decoration of things made.
6. Gives the child an appreciation for a well-made article.
7. Gives opportunity for developing power of invention.
  - (a) Selection of size appropriate for certain uses.
  - (b) Selection of material appropriate for certain uses.
  - (c) Selection of form and color appropriate for certain uses.
8. Application of labor. Gives the child an opportunity to expend his energy on lines that are educative.
9. It furnishes opportunity for educative seat work.

September.

## CONSTRUCTION WORK FOR FIRST GRADE.

## KINDS OF CUTTING.

## 1. CUTTING IN MASS:

*Purpose:*

To give skill and training in handling the scissors thru the interest the pupils have at this particular season in the common vegetables, fruits, animals, and birds, as shown in Plates 1 and 2.

The written and printed words should be taught at the time the cutting is being done.

Good pictures of vegetables may be obtained from old seed catalogs, or cutting sheets may be purchased of Thomas Charles, 207 North Michigan Avenue, at the rate of 7 cents per dozen sheets.

"Cutting in Mass" is especially good for beginning first-graders because of the freedom allowed in the cutting.

The pupil sees the mass and not a fine line as in the line cutting.

A good hektograph will be of great value in this work.

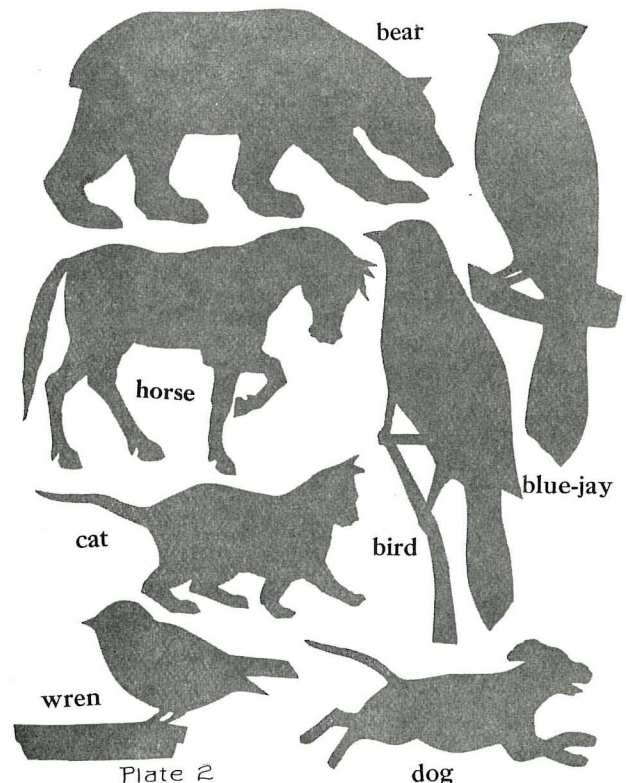


Plate 2

First Grade.



## MAKING A BLOCK PRINT.

If the teacher so desires, a very interesting block print may be made of a potato or a turnip. With a large knife, cut the potato or turnip so the largest possible surface is obtained. On this surface, lay a paper cutting or any form desired, and cut vertically around the edge of the pattern thus placed. From the outer edge of the potato or turnip, cut horizontally toward the vertical cut. This causes the part of the potato or turnip outside the edges of the paper to fall away, leaving the desired form, from a quarter to a half inch higher than the other part of the potato or turnip.

To make a printing pad, take a piece of cheesecloth, fold it several times, and moisten with water. Pour a small quantity of ink on the moistened cheesecloth pad. Place the potato or turnip block print on the pad and then stamp on a piece of drawing paper. It takes but a very short time to stamp a sufficient number for pupils of a whole room. The picture thus printed may be cut in a similar manner as the cuttings of previous lessons.

By allowing each pupil to have several block prints of the same kind, a very interesting border may be arranged in the cutting book. Or, one print may be provided for each pupil to be used as a pattern around which he may draw. This leads to cutting to line.

Any line of work that is worth doing is worth preserving. The children are led by the teacher to the absolute necessity of

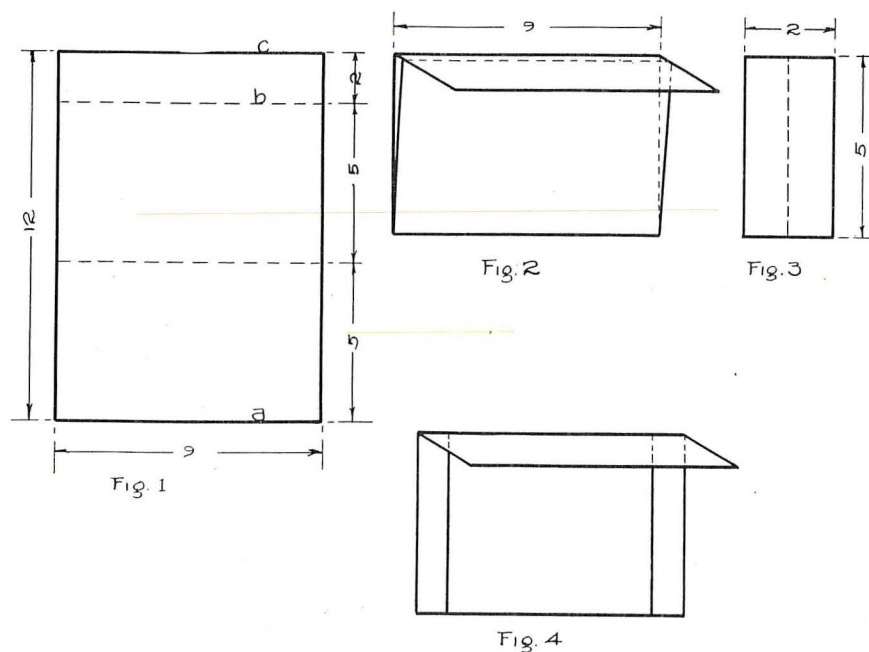
*Construction of Envelope:*

Fold over about two inches of the short edge of a piece of 9"x12" construction paper. Fig. 1.

Fold the opposite edge of the paper up to the crease which is indicated by the dotted line. Fig. 1.

All dotted lines indicate folding. Since this folding is free-hand, no two envelopes will be exactly the same. When the edge "a" is folded up to the dotted line "b", and the edge "c" is folded downward to the dotted line "b," we have what is shown in Figure 2.

To close the edges, it will be necessary, in this exercise, for the teacher to cut on the paper cutter strips of paper 5 inches long and 2 inches wide (see Fig. 3), and have the children fold them lengthwise into halves. Paste is applied, and the folded strips are pasted along the right and left edges of the envelope. In case the folded strips are not exactly as long as the edges over which they are pasted, permit them to come even with the closed bottom edge of the envelope. In case the folded strips are too long, permit the surplus to extend beyond the closed bottom edge. After the pasting is completed, the surplus may be cut away. This completes the envelope (see Fig. 4), which is to be used for all lines of cutting until the best ones are chosen to be used for the mounting book. Those not chosen may now be discarded. The child feels very differently when he discards the ones not wanted, from the way he feels when the teacher orders the work brushed into the waste basket at the close of each lesson.



First Grade.

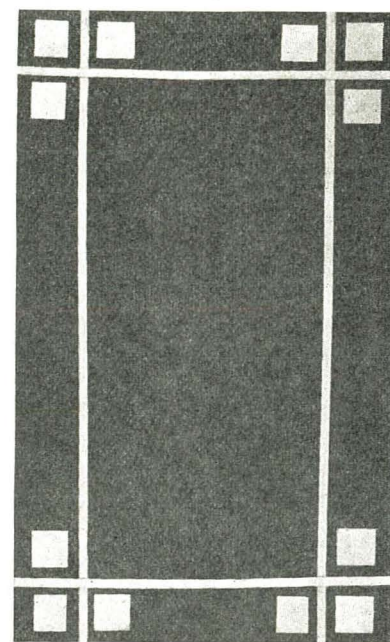


Fig. 5. First Grade.

constructing some sort of receptacle to hold the cuttings. Whenever possible give the children a voice in planning what is to be constructed. It is necessary that the teacher have something definite in mind in order to get the very best from the children.

## CUTTING ENVELOPE.

*Purpose:*

To provide a way for the pupils to care for their cuttings until a mounting book has been constructed.

To begin to teach the pupils to care for their work in a systematic and orderly way.

*Materials:*

Tinted construction paper; 50 pieces 9"x12".

*Presentation:*

The pupils are already enthusiastic over the construction of a box or envelope into which to place their cuttings.

Pass to each pupil a piece of the 9"x12" construction paper. (This size is selected, because at this time the pupil is unable to handle the 12"x18" size.)

Why is an envelope better for cuttings than a box?

With the paper on each desk, allow the pupils to suggest ways the envelope might be constructed.

*Simple Decoration:*

By means of Waldcraft sticks or paper cutting, simple design may be applied. To draw the straight lines as shown in Fig. 5, place the ruler or a strip of heavy paper on the envelope so one long edge coincides with one long edge of the envelope. Along the opposite long edge draw the straight lines as shown in Fig. 5, using crayola of the desired color. With the Waldcraft sticks and color pads print the squares as shown in Fig. 5. Squares of paper may be cut and pasted instead of using the dyes. With beginning pupils the applied art may be omitted.

## CUTTING FROM OBJECT.

It is often well to place an object where the pupils can see it and then have them cut. The idea is to have the pupils look at the object only occasionally while cutting.

## CUTTING FROM MEMORY.

The day following, remove the object and have the pupils cut from memory.

Have the pupils show by cutting or tearing something observed on their way to or from school. This will aid in cultivating the memory.



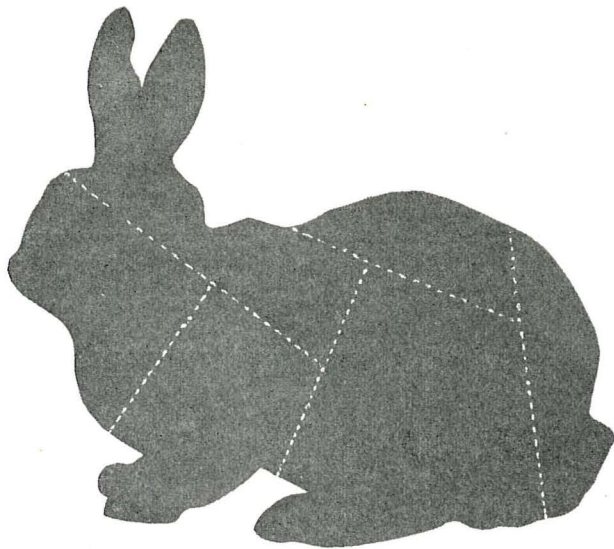


Fig. 6  
First Grade.

### CUTTING TO LINE.

*Purpose:*

To provide for motor activity, skill, and seat work.

*Material:*

Manila drawing paper.

*Tools:*

Hektograph, hektograph ink, and scissors.

It has already been suggested that the pupils be allowed to use the mass cutting as a pattern in obtaining outlines for line cutting.

It is not absolutely necessary that the teacher be an expert in drawing in order to prepare line cutting for children. There may be found in the market animals, fruit, trees, and other forms in silhouette or outline. With a good set of these in each school building, the work is very much simplified.

To prepare the above lesson, place a piece of carbon paper (black side down) upon a piece of glazed white paper. Upon this carbon paper place the silhouette form of a rabbit, or whatever form is desired. Trace the outer edge of the silhouette with a lead pencil (a pointed stick will do). Draw similar lines as shown by dotted lines (Fig. 6). Upon removing the silhouette form and the carbon paper, it will be found that the outline and all other lines traced are upon the glazed white paper. The outline upon the glazed white paper may now be traced with hektograph ink. When thoroly dry, place the glazed paper (inked side down) upon the hektograph and smooth carefully with a cloth. In about a minute remove the glazed paper, and the outline and all other lines are upon the surface of the hektograph. The outline is now ready to be transferred to any kind of paper you may care to use,—in this case, tinted construction paper.

Place the tinted construction paper, one sheet at a time, upon the hektograph, and rub gently. In this way the outline is transferred to as many sheets as may be desired. These in turn may be passed to the pupils, who will cut along the outline first, and then along all cross lines, thus dividing the silhouette into several pieces.

### THE GAME.

The pupils, during a long period when in their seats, may occupy their time in putting together the dissected parts to again form the animal. To care for these parts requires the construction of another envelope.

### ENVELOPE FOR DISSECTED CUTTINGS.

*Purpose:*

To provide a place for the dissected picture.

To give the child educative employment at his desk.

*Materials:*

50 pieces of tinted construction paper, 6"x9". 100 pieces construction paper, 1½"x3".

*Presentation:*

Since the construction of this exercise is the same as that of the cutting envelope, only smaller, it might be well to furnish the pupils with the necessary materials, allowing them to construct independently.

Place first the parts of only one animal in the envelope, and permit the children to lay the parts to form the animal. Later, all the parts of two animals may be placed in the same envelope, and the children permitted to lay the pieces to form the animals.

### CARE OF SEAT WORK.

To aid in caring for seat work, number each envelope or box. Place the same number on each piece that is put into the box. When pieces are dropped onto the floor by the children, it will be an easy matter to place each part in its proper box or envelope.

### MORE CUTTING TO LINE.

Another interesting exercise in "Cutting to Line" may be had by furnishing each child with a pattern of the desired form and permitting him to place the pattern upon the paper. With a sharp pencil draw around it and then cut along the outline drawn.

Occasional lessons of this kind are very helpful to both teacher and pupils in the beginning work. To secure the patterns above mentioned, use the hektograph as already directed, and have the pupils of the second grade do the cutting. Later, when the pupils cut from objects or from imagination, they will often wish to duplicate a certain cutting by using the original one for a pattern.

### TO MAKE A HEKTOGRAPH.

If the school is not provided with a duplicator of some kind, the following is a good recipe for making a hektograph:

For the teacher who cares to make a hektograph for herself, this recipe is given. The amount is sufficient to fill a pan 9"x12" and ¾" deep:

2 ounces of gelatine in sheets.

1 pint of glycerine.

Put into double boiler and cook slowly for two hours. Pour into the pan and allow to cool. It takes about three hours to cool sufficiently to be in condition to use.

Wash off with a sponge and luke warm water after using.

The copy should be written with hektograph ink on a paper having a smooth surface. Lay the copy, face down, and leave for about two minutes, smoothing it with a cloth. In making the duplicates the paper is smoothed over the surface and removed immediately.

### CUTTING FROM OBJECT.

It is often well to place an object where the pupils can see it and then have them cut. The idea is to have the pupils look at the object only occasionally while cutting.

### CUTTING FROM MEMORY.

The day following, remove the object and have the pupils cut from memory.

### FREEHAND IMAGINATIVE CUTTING.

Any of the objects suggested for mass or line cutting will furnish materials for free-hand cutting lesson.

This phase of cutting grows largely out of the work in English. At the close of a story period, or at the end of a reading lesson, the children may be given an opportunity to express some part of the story in paper cutting or tearing. This, at first, is usually done in one piece. Later, the illustrative cuttings may be done in parts, and afterwards assembled in such a way as to make a pleasing arrangement. Such an exercise should be preceded by a group problem. To do this, select some story like "The Landing of the Pilgrims," Indian life, or even a barn-yard scene. Any of the above offer a splendid opportunity for many cuttings. In the "Landing of the Pilgrims," all the children cut trees. From experience, we know that some cut trees as large as the paper will allow, while others cut only very small ones. In building up the forest, all cutting of trees may be used by placing the large ones in the foreground and the smaller ones in the background, thus giving, unconsciously, the first rules of perspective.

Criticism of one's own work is necessary for growth, and much attention should be given to correct form and proportions.



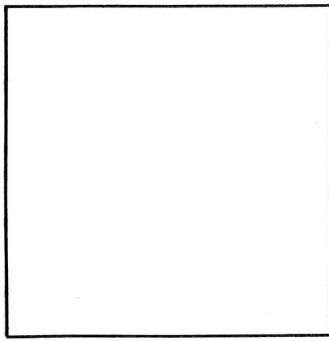


Fig 7

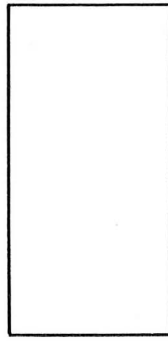


Fig 8

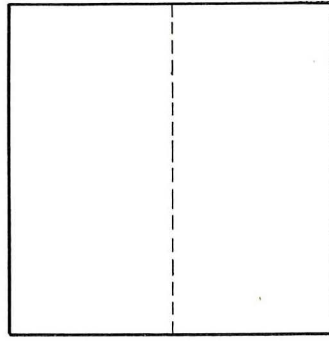


Fig 9

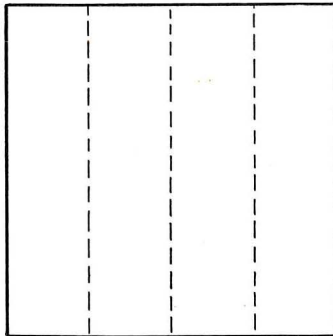


Fig 10

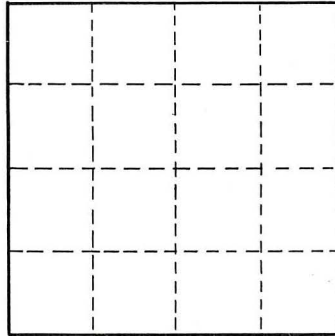


Fig 11

First Grade.

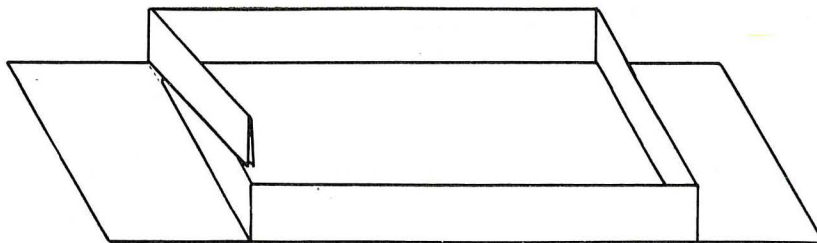


Fig 14

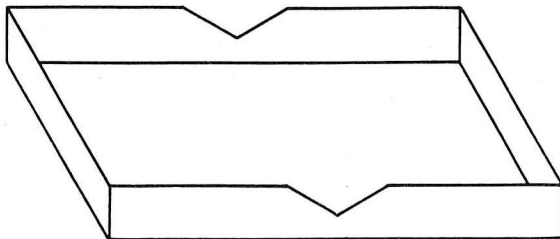


Fig 15

First Grade.

## BOX FOR SHOE PEGS.

*Purpose:*

To hold colored shoe pegs to be used in connection with number and seat work.

*Material:*

One hundred 9" squares of tinted construction paper.

*Presentation:*

As in the case of the envelopes for the cuttings and the dissected pictures, the pupils will appreciate the absolute necessity of providing for the care of the shoe pegs. After a general discussion on the construction of such a box, pass to each child a 9" square of paper. Call attention to the shape of the paper. See Fig. 7. How many corners has it? How many edges has the square? What can you say of their length? (All the same length.)

In order that the box shall be a trifle smaller than the cover, have the pupils cut from two edges of the square a narrow strip

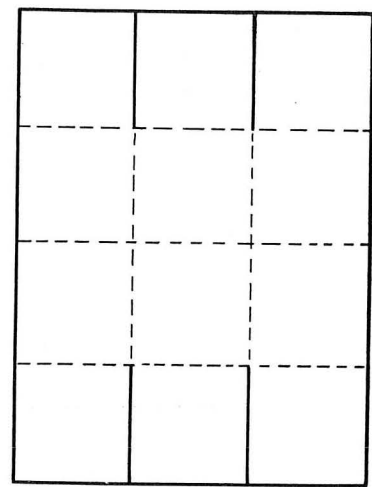


Fig 12

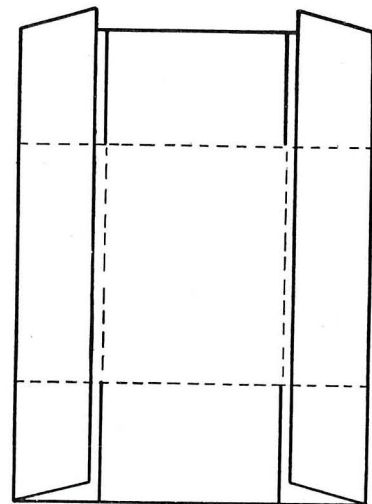


Fig 13

First Grade.

about  $\frac{1}{8}$ " wide. The paper remains practically a square, or pass the pupils squares that measure  $8\frac{7}{8}$ ".

For convenience, name the edges right and left, upper and lower, or front and back. Have pupils point to the right edge, left edge, front edge, and back edge.

Hold the square by right and left edges. Fold the paper so these edges exactly meet, and crease. Fig. 8. What is the shape of your paper now? Fig. 8—oblong. How many corners has it? How many edges? Are the edges of the oblong all the same length? Open the paper. Fig. 9. How many oblongs are there in the open paper? What part of the square is each oblong. Find the crease made by folding. Fold the right edge of the paper to the crease. Fold the left side so that it will look like the right side. Unfold. How many oblongs are there now? Fig. 10. Hold the paper so the crease runs from right to left and fold again as above. (See Fig. 11.)

Since other boxes are to be constructed, it will not be necessary to attempt to develop all the number work which may be given out of such a construction lesson.

It will be remembered that all dotted lines indicate creases, while the continuous lines should be cut.

Cut away one row of squares, as indicated in Fig. 12. How many squares are left? Fig. 11. Fold right and left edges into the creases marked "a, b" and "c, d." Fig. 13. The ends of the box have double foldings. Slip one within the other, as shown in Fig. 14. The end square as shown in Fig. 14 is now folded over the already double end into the inside of box, thus making it strong and suitable for various kinds of materials to be used in seat work. Library paste will greatly aid in strengthening the box.

## COVER FOR BOX.

The cover for the box is constructed the same as the box, except that the full 9" square is used.

Provide each child with another 9" square of tinted construction paper, permitting him to fold as in previous exercise, without any directions. As a convenience in removing the cover, cut a small triangle from each of the long sides. Fig. 15.

Do not over-direct the work, but give the child every possible opportunity to help himself.

The above exercise results in a very substantial box, which may be used to hold colored pegs.

*Material Required for the Month of September.*

3 pks. of 9"x12" tinted construction paper, at 12c....\$0.36

2 boxes of colored shoe pegs, at 15c..... .30

1 pt. can of library paste, at 35c..... .35

Total.....\$1.01

September.

## CONSTRUCTION WORK FOR SECOND GRADE.

It must be remembered that the Beginning Second Grade is simply a short step beyond the Advanced First Grade. For this reason the beginning second grade work should be very little more difficult than that of the first grade. The pupils have been away for a long vacation, so have seemingly forgotten much of the work done during the previous year. It will, therefore, be necessary to begin with simple exercises. In the first grade only the inch divisions of the ruler were used. It might be well to continue in the inch divisions for the month of September for the second grade. Even a combination of folding and measuring for the first two or three exercises might be profitably used.

## CUTTING AND TEARING.

Free-hand and imaginative.

One-piece cutting.

*Purpose:*

To train the mind, hand, and eye to work together.

To teach originality and the power to create.

*Material:*

Number paper, tinted construction manila drawing, and kraft paper. When language or drawing paper has been used only on one side, it may again be used in the cutting and tearing.

*Presentation:*

At the beginning of the year the cuttings should be free-hand, and from memory or imagination. The cuttings should be done in one piece, thus avoiding the assembling of parts in the early part of the year. The pupils, after a long vacation, are full of ideas growing out of their holiday experiences. As in the first grade, all cuttings should be preserved. A cutting book will be constructed some time during the month of October, into which each child's best cuttings will be mounted.

## CUTTING ENVELOPE.

*Purpose:*

To provide a way of caring for cuttings until mounted in cutting book.

To provide for easy measuring.

*Material:*

50 sheets of 12"x18" manila drawing paper of tinted construction paper.

50 sheets of 6"x9" manila drawing paper, or tinted construction paper.

*Presentation:*

As in the first grade, the pupils themselves can appreciate the value of the cutting envelope because of the necessity which has been created for it thru caring for the freehand cuttings.

Allow the pupils to suggest various ways the envelope might be constructed. One whole lesson can be very profitably spent in planning with the class.

## CONSTRUCTION OF ENVELOPES.

Place the paper on the desk so the 12-inch edge is parallel with the front edge of the desk. On the long edge, and two inches from the front corners, place dots. Connect these dots by a straight line. Fig. 1. Fold the opposite 12-inch edge to meet the line just drawn, and crease well. Fig. 2. Fold the two-inch strip so it closes what will be the opening in the envelope. Fig. 3.

<u>2</u>	<u>6</u>	<u>8</u>	<u>10</u>
1 + 1	—	—	—
3	—	—	—
2 + 1	3 + 3	—	—
4	4 + 2	4 + 4	—
—	5 + 1	5 + 3	5 + 5
—	7	6 + 2	6 + 4
2 + 2	—	7 + 1	7 + 3
3 + 1	—	9	8 + 2
5	3 + 4	—	9 + 1
—	6 + 1	—	—
—	5 + 2	—	—
3 + 2	8 + 1	6 + 3	—
4 + 1	5 + 4	7 + 2	—

## Plate 1

Second Grade.

Place the envelope so the closed edge is parallel with the front edge of the desk. Place the ruler along the right open side of the envelope so one long edge of the ruler coincides with the edges of the paper. With a pencil draw a line along the opposite edge of the ruler. The line just drawn is as far from the edge of the paper as the ruler is wide. Fig. 4. Cut on this line, cutting only one thickness of the paper. Cut on the crease above and below and two rectangular pieces of paper fall away. Fig. 5. Repeat for the opposite side. Paste the extended pieces on to the envelope thus closing the sides. Fig. 6. Fig. 7 shows a decorated envelope by using the Waldcraft sticks and dyes. The decoration may be carried out in paper.

*Purpose:*

## BOX.

To be used for number cards up to ten. Plate 1.

To continue the concrete constructive work of first grade.

*Material:*

One hundred 9"x12" pieces of manila drawing or tinted construction paper.

Each child has already had the set of number cards up to ten. The cards have been cut apart as directed. In his own mind a necessity for the box has already been created. Plan with the class the construction of a desirable box to hold the cards. This exercise may be a combination of measuring and cutting.

Put such questions as the following to the class:

How long must the box be to hold the blank card with the number 10 at the top? How wide?

If the box is just as long and as wide as the card, will it be large enough? Why?

How much larger do you think it should be?

How deep would you like your box?

What color would you like? Why?

## CONSTRUCTION OF BOX.

It will require two 9"x12" pieces of manila or tinted constructive paper to construct the box above mentioned. From the material furnished, cut two eight-inch squares, one to be used for the box and the other for the cover. From the square used for the box cut free-hand a strip about one-eighth inch wide from two edges. This still leaves a square. From this square fold the box.



n	ame	h	eat	n	ight	s	old
c	ame	s	eat	t	ight	t	old
l	ame	m	eat	f	ight	b	old
t	ame	b	eat	l	ight	c	old
s	ame	ch	eat	r	ight	f	old

## Plate 2

Second Grade.

From the eight-inch square fold the cover. This difference in size makes it possible to easily remove the cover.

Fold the squares into sixteen small squares, as in the first grade box construction, reviewing the number as the construction proceeds.

Cut away one row of squares. Cut and fold the remaining three rows into box form, making the sides and ends double. For detail in construction, see first grade work.

To strengthen the box, use paste to paste down sides and ends. From the middle of each side of the cover, cut a small triangle. By so doing the box may be held while the cover is being removed.

### HOW TO USE THE NUMBER CARDS.

(Cut on all continuous solid lines.) Plate 1.

The blank cards on which the short, solid lines are drawn, are placed on the desk, ranging in their order from two to ten inclusive. The various combinations are picked up, one at a time, and placed on the blank cards.

The short lines indicate the number of combination to be placed on each blank card.

Do not allow pupils to get into the habit of looking for some one particular combination but have him understand that each time he picks there is a place for what he picks and that it should be placed whether a combination of two, eight, ten or any other combination.

### CARE OF SEAT WORK.

Each box should be numbered. Each piece of seat work should have the corresponding number on it. This makes it easily cared for. If a piece falls on the floor, and has been numbered the same as the box, it is easily placed in its proper place.

If the teacher will construct of straw board, or any heavy paper, a number of shallow trays, they may be used to hold the various lines of seat work, thus taking it out of the pupils' desks. At any time a certain line of seat work is to be used, the tray may be passed and each child provided with a box. If this is done for each line of seat work, it will be kept in good condition and always in readiness.

### ENVELOPE.

This is to be a small envelope, to be used for phonograms.

#### Purpose:

To give the pupils an opportunity to construct an envelope from the experience gained in the construction of the cutting envelope.

#### Material:

1 sheet of 6"x9" tinted construction or manila drawing paper.

#### Presentation:

As in previous exercises the pupils must know what the content of the envelope is to be. For this reason a card containing a complete list of words should be passed to each child. This exercise affords a very simple and interesting review of work done last year, and may be given to the pupils of the first grade after losing its value in the second grade.

With the 6"x9" piece of paper on each child's desk, discuss with them the various ways of constructing envelopes to hold the exercise at hand.

### THE SHEET OF PHONOGRAMS: Plate 2.

For seat work, first cut along the continuous lines separating the different words. Cut again along the lines separating the initial letter from the ending. The parts are all placed in the envelope. During a period for seat work, the pupils arrange the words in families by first placing the ending and then finding the initial letter for each ending.

#### Preparation of Seat Work:

Any of the seat work mentioned in the various outlines may readily be prepared by the teacher with the assistance of a good hektograph. See outline for First Grade for directions in making hektograph.

### BOX.

#### Purpose:

To make a box to hold colored sticks.

To teach neatness and accuracy.

To make possible practical number work.

#### Material:

50 sheets 9"x12" tinted construction paper.

Library paste.

#### Tools:

Ruler, scissors, lead pencil.

#### Presentation:

It is taken for granted that the pupils have used the colored sticks in some previous lesson. They have experienced the inconvenience of passing and collecting materials. In short, a real necessity has been created for the construction of a receptacle to hold the sticks. In this case, it is to be a box.

The size and shape of any box must be determined by its use. Since this box is to be used for sticks, and the longest stick is but five inches in length, it would not be necessary to make a box seven or eight inches long. Put before the pupils the question of length, and have them decide what the length should be. Five and a half or six inches in length will allow sufficient room to remove the sticks with ease.

Having decided upon the length, the width should be considered. The pupils will find from experience with the sticks on the desk that a box two inches wide will be quite wide enough. Have the pupils draw a line 6 inches long. Draw a line 2 inches long.

It is not at all expected that the pupils will all give the above dimensions. It is only careful questioning on the part of the teacher that will lead them to see that any length less than 5½ or 6 inches would be too short, and any width less than 1½ inches would be too narrow.

The next dimension to be considered is the depth. This, again, the pupils may easily determine from their experience with the sticks on their desks. After a certain amount of discussion, it may be decided that ½ or ¾ inch would be quite deep enough.

Have the pupils draw a line ½ inch in length. Since the second-grade pupils work only in inches and half inches, it might be well to decide definitely that the box is to be one-half inch deep.

There is no doubt but the pupils who are to construct the above box have constructed boxes in the first grade. If so, they are familiar with the fact that in order to make the box substantial, the sides and ends should be double.

The question then is: How large must the paper be in order to have a box that, when finished, shall be six inches long, two inches wide, and one-half inch deep, the sides and ends being double?

In determining this, the teacher may draw upon the blackboard a rectangle 6" long and 2" wide. See Fig. 7.

How much must be added to one side in order that the box may be ½" deep? See Fig. 8. The sides to be double.

How much must be added to the other side in order that the box may be ½" deep and double? Fig. 9.

How wide must the paper be in order to make the box? (2" plus 1" plus 1" equals 4½".) See Fig. 9.

How much must be added to one end in order that the box may be ½" deep and the end double? See Fig. 10.

How much added to the other end? Fig. 11. (6" plus 1" plus 1" equals 8".)

In the above way the class determines the dimensions of the piece of paper necessary to make the desired box. The rectangle drawn is 8 inches long and 4 inches wide.

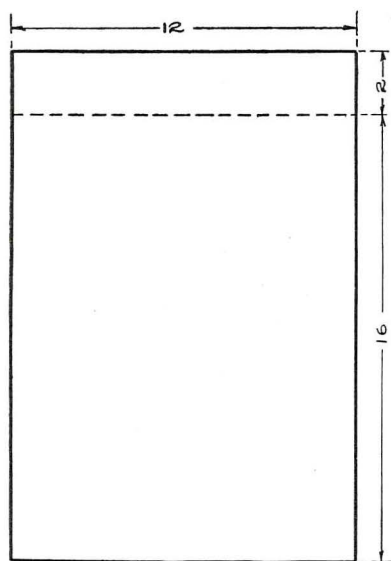


Fig. 1

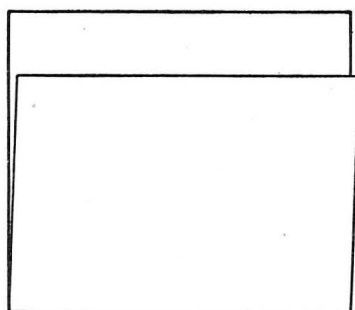


Fig. 2

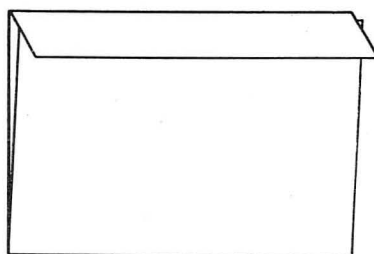


Fig. 3

Second Grade.

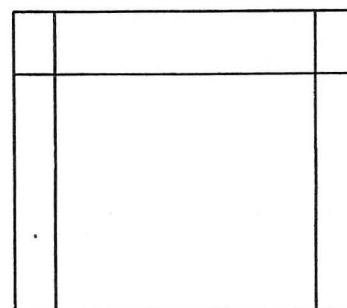


Fig. 4

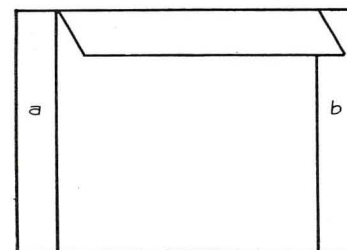


Fig. 5

Second Grade.

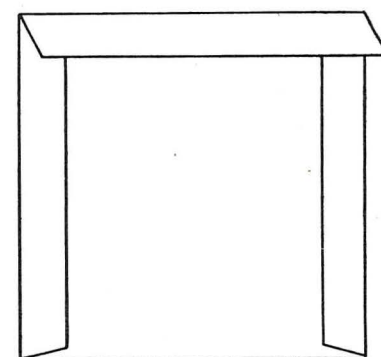


Fig. 6

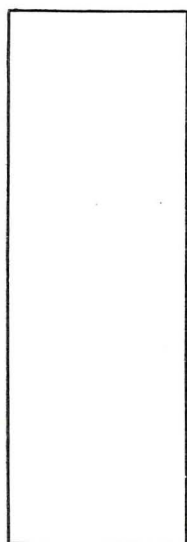


Fig. 7

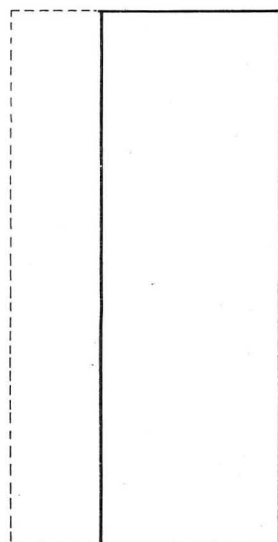


Fig. 8

Second Grade.

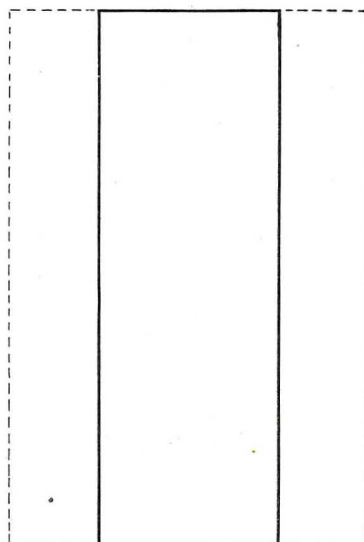


Fig. 9

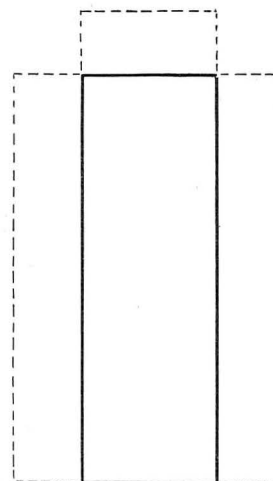


Fig. 10

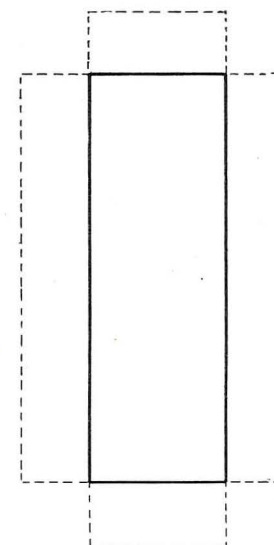


Fig. 11

Second Grade.

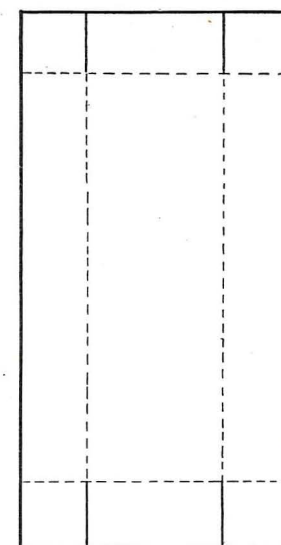


Fig. 12



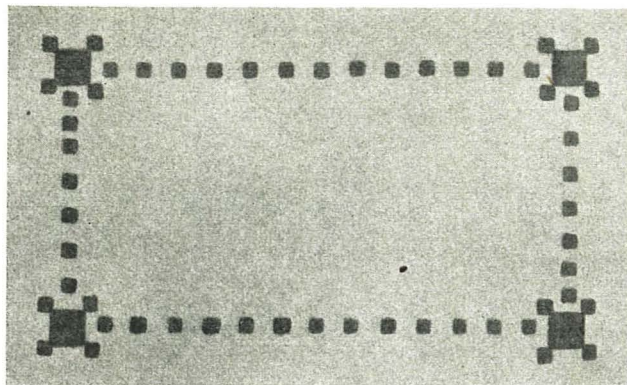


Fig. 7. Second Grade.

Many practical questions, similar to the following, may be asked of the pupils:

Draw a line equal in length to one short edge and one long edge of the rectangle. How much longer is the rectangle than it is wide? What is the distance around the rectangle (perimeter)?

What is the length of the two short edges put together?

The width is what part of the length?

The length is how many times the width?

The class is now ready to continue the construction of the box.

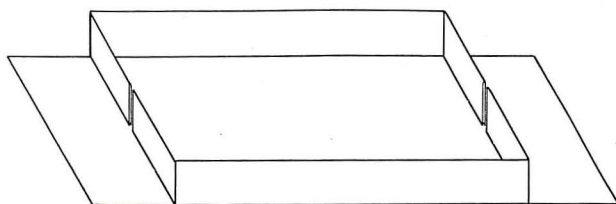


Fig. 13

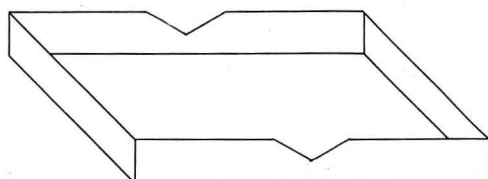


Fig. 14

Second Grade.

After cutting the rectangle 6"x4" for the box, cut a narrow strip about  $\frac{1}{4}$ " wide from one long edge and another such strip from one short edge. This will make the box, when finished, a trifle smaller than the cover.

To make a pattern drawing of the box, place dots on the right and left edges one inch from the corners, and connect corresponding dots by straight lines. Place dots on the front and back edges one inch from the corners, and connect corresponding dots. Fig. 12.

It will be remembered that all dotted lines are creased and all continuous lines are cut.

In order to secure the double ends and sides, fold the outer edges into dotted lines. Slip the ends one within the other, and fold rectangle at each end over the end inside of box. Fig. 13.

#### THE COVER.

To make the cover, proceed with the box construction. To aid in removing the cover, a small triangle may be cut from each side, thus making it possible to hold the box while the cover is being removed. Fig. 14.

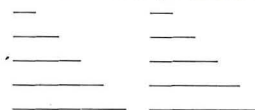
The box is strengthened by the use of library paste, but it will remain nicely folded without the paste.

If, for any reason, the work outlined for September is not completed during the month, it should be carried over in October and finished before beginning the October work.

#### SUGGESTIONS FOR THE USE OF STICKS.

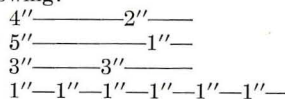
1. With sticks of different lengths, sort as to length, putting all the 1" sticks in one pile, the 2" sticks in another, etc.

2. Arrange sticks according to length,—



3. Make combinations with sticks of different lengths. Lay a 5" stick; under it lay a 1" and a 4" stick; then a 2" and a 3" one.

4. With the help of a ruler, lay a stick 6" long, using any number of smaller sticks. The child finds that he may use the following:



5. Use sticks of different lengths to lay squares, putting the 1" one in the center, and the 2", 3", 4" and 5" squares outside of that. Fig. 16.

7. Build the sides of a log house: Use sticks of the same length, three or four inches long. Lay two sticks on the desk, parallel to each other, and not quite the length of the sticks apart. Lay two others across these two. Lay two across the second pair. Use as many sticks as you wish. Toothpicks may be used in the same way.

8. Use 6 sticks, 3" or 4", to lay a star. Lay a triangle and with the other three sticks lay another triangle on top of the first one.

9. A five-pointed star may be made with pegs or 1" sticks. Use five sticks to lay a pentagon.

On each side of the pentagon, with two other sticks, build a triangle.

10. Use sticks to lay rectangles of different sizes. Lay a rectangle 5" long and 3" wide. This may be done by using sticks of various lengths.

Have pupils find perimeter by laying the sticks forming the sides and ends of rectangle into one straight line. Since the longest stick is 5", the pupil is compelled to make the various combinations when the length or width of a rectangle exceeds five inches.

#### Material necessary.

1 pk. of 12"x18" construction paper.....	\$0.24
2 pks. of 9"x12" construction paper, at 12c.....	.24
Manila drawing paper 9"x21", per ream.....	.50
1 can library paste.....	.30

#### Colored Sticks.

1 pk. of 250 one inch long.....	\$0.12
1 pk. of 250 two inch long.....	.16
1 pk. of 250 three inches long.....	.20
1 pk. of 250 four inches long.....	.24
1 pk. of 250 five inches long.....	.28

September.

#### CONSTRUCTION WORK FOR THIRD GRADE.

With a small amount of money to expend, it becomes necessary to plan for the construction work as economically as possible and, at the same time, consider the value of the exercise to the child. There is great danger of the teacher becoming over-ambitious. Too much is expected of young children, and in order to make a good showing the teacher unconsciously does much work the children should do.

Be content with a child's efforts, and choose such work as children can do, and do well. Teachers are often heard to say at the close of a lesson, "It is good for a third grade," or "It is good for a second grade." Problems given to children should not be so difficult but what it is reasonable to expect that they shall be well done. "It is good enough" will not do when the exercise may be one better suited for a sixth grade rather than a third.

Do not be deceived by the fancy forms that are often turned out by our pupils, carrying but little value with them.

Each exercise given to the pupil should be so planned that its construction will aid in the construction of some other exercise a little more difficult. Ruler work, carefully and accurately

I	II	III	IV	V	VI

Total

Fig. 1

I	II	III	IV	V	VI
15	18	9	12	21	30
24	0	21	24	36	0
9	6	30	27	30	0
0	36	0	6	12	21
12	21	33	0	6	15
6	0	12	3	9	24
3	9	15	6	12	12
69	90	120	78	126	102

Total

Fig. 2

Third Grade.

9	7	2	11
5	1	6	3
12	8	4	10

Fig. 3

Third Grade.

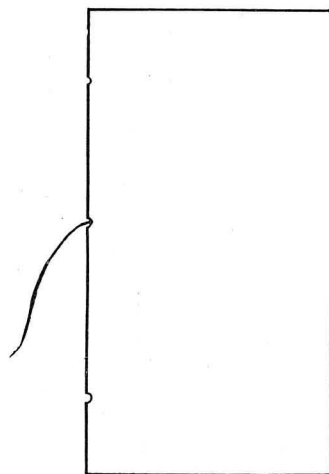


Fig. 6

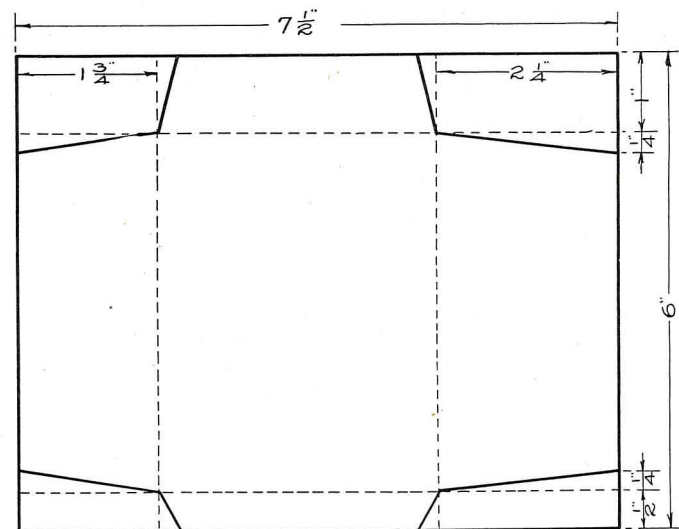


Fig. 4

Third Grade.

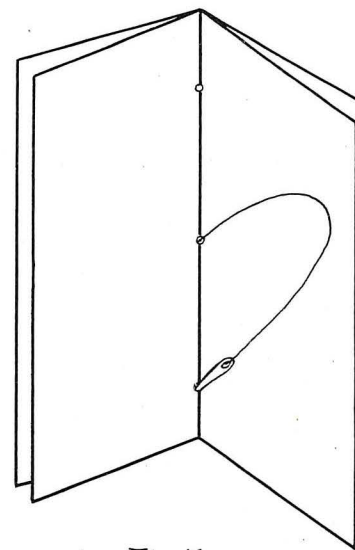


Fig. 7

Third Grade.

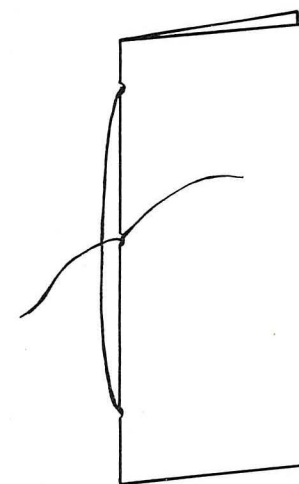


Fig. 8



done, aids greatly in securing careful and accurate work all thru the grades.

#### SCORE CARDS.

##### *Purpose:*

To teach the child to keep a simple record of each member of the class.

Gives him practical use of the multiplication tables.

Gives opportunity to do neatly and carefully half-inch measuring.

To submerge his number and construction into one subject-number.

The score card is really a plat of the room, showing the location of each child's desk. It thus becomes a lesson in early map drawing, as well as construction.

##### *Material:*

50 pieces of drawing paper or manila document, 4"x5".

##### *Presentation:*

The pupils have just returned from a long vacation. They have already played games much of their play time. An opportunity is given in this exercise to teach them how to keep systematically the score made by each child taking part in the game.

Have the pupils assist in determining the size the score card should be. The size is determined by the number of rows of seats in the room, and the number of pupils in each row. If there are six rows of seats in the room, and each row has a space  $\frac{1}{2}$ " wide, how many inches wide must the card be to show all the rows?

If there are seven pupils in each row, and  $\frac{1}{2}$ " is allowed for each pupil, how long must the score card be?

The rows must be numbered and there must be a place for the total score made by each row. If  $\frac{1}{2}$ " is allowed for the number of the row, and  $\frac{1}{2}$ " for the total, how long must the card be?

After getting from the pupils the desired data, have them measure and cut from the 4"x5" rectangle of manila drawing paper or manila document, a rectangle 3"x4 $\frac{1}{2}$ ". The width and length is determined by the number of rows of seats and the number of pupils in each row. Divide the rectangle into half-inch squares as shown in Fig. 1.

#### ENVELOPE.

##### *Purpose:*

To hold the score card.

Provides excellent opportunity for accurate measuring.

To begin mechanical drawing.

##### *Material:*

50 pieces of 6"x9" manila drawing, or tinted construction paper.

##### *Presentation:*

The interest in the construction of the envelope has already been created thru the completion of the score card. The class might be questioned in regard to necessary dimensions and color. Why is a dark color for this particular envelope better than a light colored paper?

##### *Construction of Envelope:*

From the 6"x9" piece of paper, cut a rectangle 7 $\frac{1}{2}$ "x6".

#### LEARNING TO READ A PATTERN DRAWING.

Pupils should learn to read a pattern drawing when placed on the blackboard. They should be made to feel that a pattern drawing is only a mode of expression. It is a language understood by those who have learned to read it.

Pattern drawings and mechanical drawings are thought by many to be the same. This is not true. The pattern drawing gives but two dimensions, length and breadth; while in the mechanical drawing the third dimension, thickness, enters.

In order to interpret a pattern drawing, have the pupil understand that two little dots (") placed above and to the right of a figure indicate inches. All dotted lines (.....) indicate folding, and all continuous lines (—) indicate places to be cut. Understanding this, the pupil will be able to interpret the pattern drawing shown. Fig. 4, gives all the dimensions necessary for the construction of the envelope for score card.

With the use of Waldcraft sticks and dyes or paper cutting add some simple design.

#### THE GAME.

Draw upon the blackboard a rectangle four feet long and three feet wide. Divide rectangle into foot squares. In each

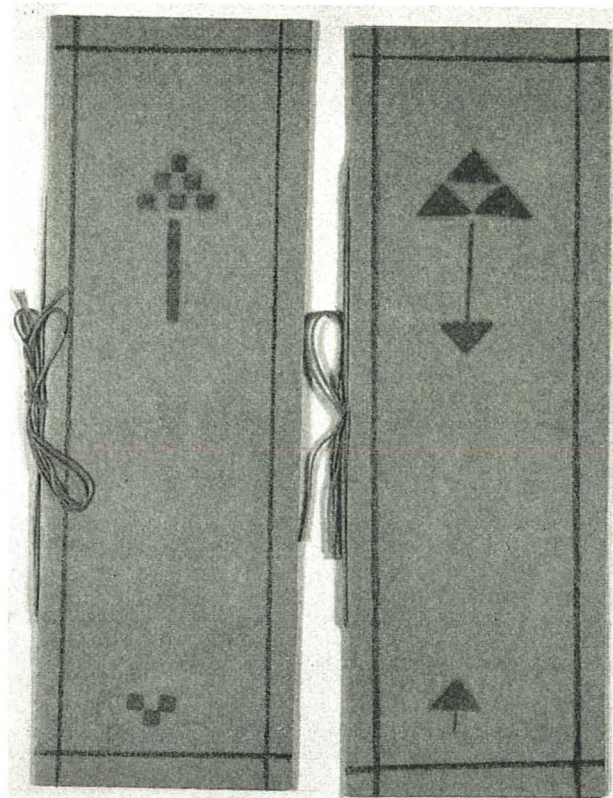


Fig. 5. Third Grade.

square place a figure of the multiplication table, from 1 to 12. Fig. 3.

About 10 or 12 feet in front of the drawing, place a chalk mark on the floor. Provide a tennis ball and a damp sponge. Dampen the ball on sponge and allow the pupil in the back seat of row 1, with his toes on the chalk mark, to throw the ball. If it strikes within the square containing 5, that pupil's score is fifteen, and is recorded by each pupil in the room in the half-inch square corresponding to his seat. In this case, multiply by three each time the ball strikes. If a drill in the multiplication of the fours is desired, multiply by four each time the ball strikes. Any multiplier may be chosen from 1 to 12.

The object in dampening the ball is to leave a little damp spot showing where the ball strikes. The game is played a little quicker if two balls are provided. When each child in the room has made a score, the remainder of the lesson may be used for seat work.

Figure 2 shows the score card when filled by the pupils.

Place upon the board the following problems concerning the score card:

1. What score did each row make? (Fig. 2.)
2. Which row made the highest score?
3. Which row made the lowest score?
4. How much more did row VI make than row I?  
Make other comparisons.
5. Find the average score of Row 3.
6. Find the average score of Row 4.
7. What score did the whole room make?
8. What is the average score for the room?

#### SPELLING BLANK.

##### *Purpose:*

To provide a way of keeping each day's spelling lesson.

To create a pride and interest in the child to do his work well.

##### *Material:*

250 sheets of 6"x9" number paper or the 5 $\frac{1}{2}$ "x8 $\frac{1}{2}$ " unruled language paper.

50 sheets of 6"x9" tinted construction paper.

50 pieces of carpet warp 15 inches long.

50 darning needles. Paste.



*Presentation:*

After the long vacation the children will be interested in preparing and constructing the various exercises that will aid in keeping systematically the various lines of academic work. The spelling blank is especially interesting. Discuss with the children the construction of the book.

What is a good shape for a spelling blank? Why?

Name several good colors. Why is each good?

What materials would you use in making such a book?

(If the cover is to be decorated) Where would you place the decoration?

What sort of decoration would you use?

Fig. 5 shows several simply designed covers which may be used in the decoration of spelling book covers. If the teachers will at first hold to combining tints of the same color there will be little or no danger of getting away from harmonious coloring. If a dark brown is used for the cover use tan or fawn for the design. If gray is used for the cover use blues for the design. As the pupils advance, harmonious contrasting colors may be used together.

## CONSTRUCTION OF BOOK.

*First Lesson:*

Pass to each child five sheets of the paper above mentioned. Pass each child one sheet of 6"x9" tinted construction paper.

What is the length of each sheet? What is the width?

Fold each sheet down the center lengthwise. How wide is each half? Place one folded sheet within the other until all have been placed. Place folded cover on the outside.

## TO SEW THE BOOK.

At the center of the crease, down the back, place a dot. Three inches above and below this dot place other dots. Force the darning needle thru the sheets at each dot.

Thread the needle with a suitable color of carpet warp, and begin to sew by bringing the needle thru the center hole from

the outside of the book. The needle and the thread are now on the inside. Leave a generous end on the outside. Fig. 6. Next, bring the needle thru the hole just below the center. Fig. 7. The needle is now on the outside. Take one long stitch (Fig. 8) from the lower hole to the hole above the center, passing it to the inside. The needle is next brought thru the center hole for a second time. There are now two ends on the long stitch. Tie these two ends in a hard knot over the long stitch. The ends may also be tied in a bow knot. This will add just a little to the decoration of the book.

*Second Lesson:*

*Pasting the cover:* Turn the cover of the book back. Slip a piece of newspaper under the first page of the book and apply paste over the entire page. The newspaper will prevent the paste from getting on the other pages.

When pasted, allow the cover to fold over on to the pasted page. Press with a cloth until all wrinkles disappear. Paste the other cover in the same way.

The books should now be put into a press and left for several days.

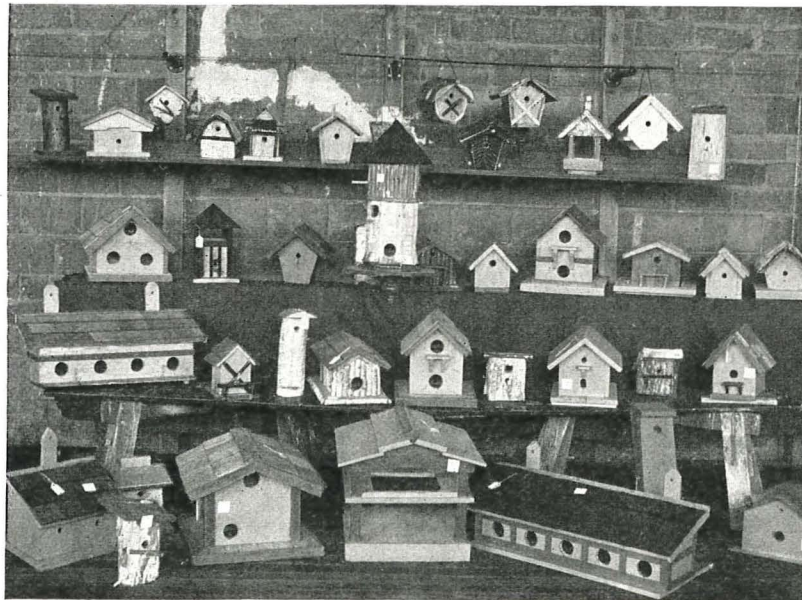
If the school is provided with a cutting machine, the books should be trimmed in it. If not, have each child trim his own as best he can with a pair of scissors.

If the pupils need drill in half inch measuring, the pages of the book may be ruled, using lines one-half inch apart.

*Cost of Materials for One Third Grade of 50 Pupils:*

50 pieces of manila drawing paper.....	\$0.05
For score cards—Price 50c per ream.	
$\frac{1}{2}$ pk. of 9"x12" construction paper for envelopes.....	.06
$\frac{1}{2}$ pk. of 9"x12" construction paper for spelling book cover.....	.06
$\frac{1}{4}$ lb. of carpet warp (1 spool).....	.10
2 pks. of darning needles.....	.10
3 pks. of unruled, plain white paper.....	.15
Purchase of any print shop.	

Outlines for October will appear in the Industrial-Arts Magazine for September, ready August 15.



A few of the ninety Bird Houses made by the sixth, seventh and eighth grade students, Bemidji, Minn., Schools, during the spring of 1916. The contest was in charge of Mr. A. D. Bailey, director of manual training.



# Some Educational Values in Productive Work

Richard M. Van Gaasbeek, School of Science and Technology, Pratt Institute, Brooklyn, N. Y.



If we are to judge authoritatively whether there are any educational values in productive work, we must go directly to the trade and ascertain definitely what are its requirements. What does the apprentice need to know about his elected trade? Does he experience any difficulty in trying to acquire this necessary information? Can the school help him to obtain it, and how?

The writer must confine his remarks to conditions as he has found them in the woodworking industry. If you can train a student to enter a commercial shop at the expiration of his school life, with the same self-reliance and confidence in his own ability that a journeyman has in traveling from one shop to another, his training has been good.

The first step in this direction then, is to make the student do things under the exact conditions that he will find in real life; and having done them, teach him how to think about what he has done, so that his next effort may be better. Teach him to observe everything, that he may apply ideas to what he does. Teach him to think consecutively, to reason, to plan his work so that he may become a master of his trade.

In addition to the development of skill and the application of the principles of the trade, it is essential as part of this training, to give in the school shop a definite idea of trade conditions. Productive work is an important factor in helping the school to do this. It gives the school an opportunity to teach organization. Men are then able to detect weak points in the shop, to look ahead, to plan and provide for its future needs, to judge men with limited opportunities when engaging new men, to handle a force of men to the greatest advantage for efficient and economic service, to make trained thinkers. The school thus insures his success by combining his mental equipment with hard work, by helping him to meet intelligent men on an equal footing.

How can you teach a student the value of commercial accuracy, commercial time or commercial responsibility, unless they have a commercial product to work on and under commercial conditions? The student must value his time at not less than \$1.00 per hour. He may have acquired the necessary skill and accuracy but has he turned out his product on time? What has the job cost at the rate of \$1.00 per hour? Is the product he has turned out worth the price he must charge to get his wages?

Then, again, the student must be taught to shoulder responsibility. The first requirement in the trade is that a journeyman must be responsible for his own work; he must turn out his own job accurately and on time. If he is not able to do this he

is given his walking papers. The next stepping stone requires him not only to be responsible for his own work but also that of others. If a man under him makes an error, he cannot go to the management and lay the fault on that man. He must take the blame on himself; he must be responsible for the output of that plant both as to accuracy and time.

Working on this belief, one student in every class is appointed foreman of his section. The class is responsible to the foreman and in turn the foreman is responsible to the instructor. Up to the present writing, each student appointed foreman has shown by his attitude toward the work, and by the enthusiasm displayed, that he does feel some responsibility. All students are referred to the foreman for any help or suggestions about their work before they can appeal to the instructor, who in turn, if the operation is important enough, may pass upon such suggestions before allowing them to proceed. I cannot report one instance where the foreman has taken any liberties with his fellow students, or of a student opposing his foreman. A spirit of hearty co-operation pervades the shop.

To help the foreman in discharging his duties the following instruction sheet was prepared.

## Instructions for the Foreman.

1. Pay attention to the instructions given for all jobs; follow the jobs up and see that the instructions are carried out.
2. Caution men about selecting their stock. Watch thickness, knots, checks, etc.
3. Enough stock must be roughed out to complete the entire job before commencing to mill it.
4. All stock must be milled on a given machine before starting on the next operation.
5. Do not allow the men to stand around waiting for a machine. Find something else for them to do until the necessary machine is idle.
6. Check up all sizes (thickness, width, length) and quantities.
7. All waste cuttings must be given to the stock.
8. Utilize trucks and horses. See that the men have their work in a convenient place near at hand when milling, and keep milled stock off the floor.
9. Return all tools to the stock clerk before leaving.
10. Return all machine equipment to its proper place.
11. Report with orders and stock to the instructor before leaving.

Work of this kind invariably begets an enthusiastic interest on the part of a student. It is a man's task, quickly recognized as such, and undertaken with corresponding ambition and energy. We may theorize about the educational value of an exercise, but the student will prove its value by the active interest he exhibits while at work.

Discussions and practice work on the keeping of records of men, of producing machines, of material, of labor time, and of production are all a part of the training of a student that he may enter the commercial field with some degree of assurance as to his

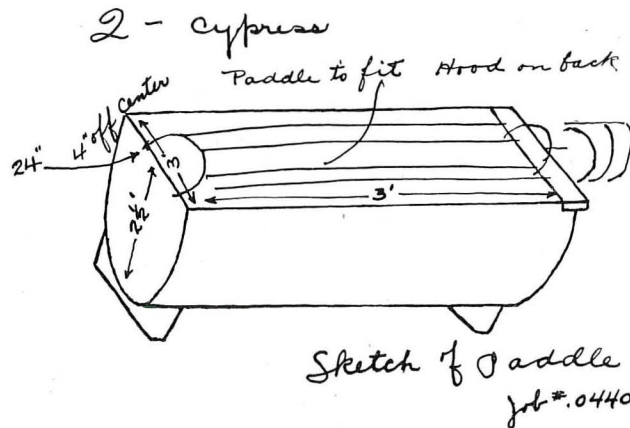


Fig. 1. A Tracing of the Original Sketch for Tanning Paddles.

own ability. It is in reality a study of the output of individual men and machines, together with the compiling of fundamental data for determining the direct cost. They provide comparisons to show how nearly they have succeeded in attaining standards of performance.

With the aid of productive work the principles of scientific management can be taught under exact conditions. The students are taught to consider how machines should be arranged, in order that material may move freely and continuously thru the plant, how trucks, horses, and elevator should be used to prevent unnecessary effort in the handling of their work. The application of these principles does not require that a man should make a slave of himself, that accuracy and high standards of workmanship should be sacrificed to speed, but, on the

contrary, it is brought to the attention of the student that workshop conditions must first be made right so that the men can work scientifically, in an atmosphere of harmony and contentment.

Let us follow a typical job of last term, thru the carpenter shop of Pratt Institute, Brooklyn, N. Y.

When the class entered the shop for the first time, a period was devoted to outlining the class of work in which they were about to engage, that each job the student worked on might become a usable article, and remain a monument to his skill. They were shown blueprints of some of the jobs on hand with a view of creating an interest from the start. They were also given an idea of what was going to be expected of them, thru a preliminary discussion of many of the factors discussed in the beginning of this article.

The second period was devoted to a general study of woodworking machines. They must have a general idea of all the machines, as any job they might be called upon to do might require such knowledge. It is essential that a student should use proper methods and form correct habits at the very beginning. He should do the right operation at the proper time and in the correct manner. With this idea in view the following mimeograph sheet was prepared, it being the belief that a student reading the operation and having it demonstrated for him at the same time is materially helped and is enabled to take hold of his work in a more businesslike way.

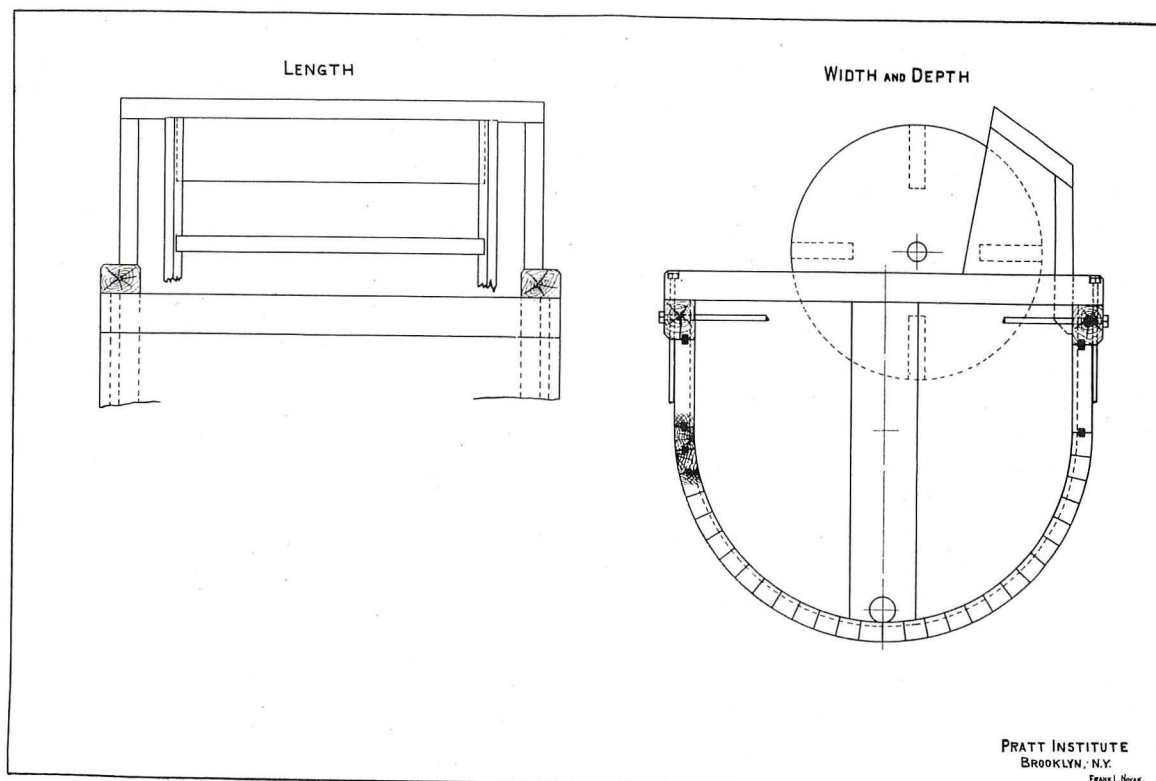


Fig. 2. Foreman's Shop Layout of Paddle.



The instructor cut a piece of rough stock from a plank according to operation No. 2 on the sheet and performed each operation in the order as listed. The entire class observed the demonstration, discussed methods of setting, operating, and keeping in order the various machines and ways of handling and passing of the stock over the machines to get the best results.

#### Mimeograph Sheet.

1. Make stock list and submit it to the instructor.
2. Swing saw. Crosscut to length, add  $\frac{1}{8}$ " for milling.
3. Rip saw. Cut to width, add  $\frac{3}{8}$ " for milling.
4. A. *Inflexible Material.*
  - a. Jointer. True face side.
  - b. Planer. Size to thickness.
  - c. Jointer. True face edge.
  - d. Rip saw. Rip to width, add  $\frac{1}{8}$ ".
  - e. Jointer. Joint to exact size.
4. B. *Flexible Material.*
  - a. Planer. Dress face side,  $\frac{1}{16}$ " cut.
  - b. Planer. Dress to exact thickness.
  - c. Jointer. True face edge.
  - d. Rip saw. Rip to width, add  $\frac{1}{8}$ ".
  - e. Jointer. Joint to exact size.
5. Crosscut saw. Square one end.
6. Crosscut saw. Cut to exact size.
7. Consult instructor. See lay-out board for mortise and tenons or holes for dowels.

A carefully prepared record sheet was kept showing the various jobs a student had been engaged on, so that the instructor could at a glance review the student's previous experience and make assignments that would be in the nature of a continuation of that experience. The following sheet was selected at random from the records of last term. This particular class had been assigned to the carpenter shop for two periods, on Tuesday and Wednesday of each week.

#### A Copy of One of the Record Sheets.

##### TUESDAY.

Student	Number	Title of Jobs.
Novak.....		Foreman
Olsen.....	0441	Desk for Room 5C.
Palnusan.....	4104	Blue Print Frames.
Pember.....	541	Assemble Stock Boxes.
Porter, K. L.....	79989	Dress Lathe Shelves
Porter, R. B.....	0443	Dado Shelving.
Preston.....	799112	Card Rack.
Purdy.....	0441	Bore Door Stiles.
Rexford.....	0441	Dress Door Panels.
Richette.....	0440	Two Paddles.
Sachse.....	722	Set, Dress and File Rip Saw.

##### WEDNESDAY.

Student	Number	Title of Jobs.
Novak.....		Foreman.
Olsen.....	04685	Dye Testing Table.
Palnusan.....	04685	Dye Testing Table.
Pember.....	79997	Hand Screw Rack.
Porter, K. L.....	1840	Fuse Rack.
Porter, R. B.....	0440	Two Paddles.
Preston.....	0440	Two Paddles.
Purdy.....	044933	Buffing Wheel.
Rexford.....	0447	Drying Racks, Tannery.
Richette.....	721	Grind Jointer Knives.
Sachse.....	0443	Stock Room Shelving.

Where titles of jobs were listed, the student was required to either list his material, mill his stock, or assemble the job according to the stage in construction at the time he reports for work.

Figure 1 is a tracing of the original sketch of a tanning paddle submitted by the tannery to the carpenter shop. Two of these were constructed and are now in use. Figure 2 shows the development in the shop lay-out. In Figure 1 no idea of construction is given, only the size that will meet the needs of the tannery. In Figure 2 every detail is worked out full size, the student applying a rule on the lay-out when listing his material. The lay-out was made by the students as a class problem under the direction of the instructor. A large lay-out board was made for the purpose and by means of questions and discussions each move was suggested by the class. Each student was required to make out a bill of material from the shop as follows, lay-out:

— ESTIMATE #2 TANKS —					
— FOR TANNERY —					
CYPRESS @ 8¢ PER BOARD FOOT			LABOR - 60¢ PER HR.		
NO OF Pcs.	SIZE	TOTAL Bd. Ft.	MACHINE OPERATIONS.		
			SAWS	JOINTER	PLANER
4	1 $\frac{7}{8}$ " x 8 $\frac{1}{4}$ " x 3'-8"	24	10 MIN.	10 MIN.	10 MIN.
56	1 $\frac{7}{8}$ " x 2 $\frac{1}{4}$ " x 3'-8"	112	180 "	60 "	40 "
4	2 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ " x 3'-8"	18	10 "	10 "	10 "
4	1 $\frac{7}{8}$ " x 30 $\frac{1}{2}$ " x 2'-6 $\frac{1}{2}$ "	57	20 "	20 "	30 "
4	2 $\frac{3}{4}$ " x 4" x 3'-6 $\frac{1}{2}$ "	15	10 "	10 "	10 "
4	1 $\frac{7}{8}$ " x 22" x 1'-10"	32	20 "	20 "	30 "
8	1 $\frac{7}{8}$ " x 7" x 2'-10"	32	20 "	20 "	30 "
2	1 $\frac{3}{4}$ " x 11" x 3'-8"	16	10 "	10 "	20 "
2	1 $\frac{3}{4}$ " x 9" x 3'-8"	14	10 "	10 "	10 "
4	1 $\frac{3}{4}$ " x 18" x 1'-6"	18	20 "	30 "	30 "
TOTALS		338	310 "	200 "	220 "
COSTS		\$27.05	\$3.10	\$2.00	\$2.20
					\$4.00
COST OF MATERIAL AND PRODUCTION..... \$38.35					
" " ASSEMBLING - 50 HOURS..... 30.00					
10% TO COVER POSSIBLE ERRORS..... 6.85					
15% PROFIT..... 10.20					
TOTAL - \$85.40					
We will build and assemble 2 tanks complete as per sketch and specifications for the price of \$85.40 Lumber is to be delivered at our mill Erecting of tanks to be done by purchaser.					
Submitted by - Frank L. Novak.					
Feb. 10 - 1916					

Fig. 3. A Tracing of one of the Estimates submitted by a student.

#### Bill of Material.

##### Sides.

- 4 pieces 1 $\frac{7}{8}$ " x 8 $\frac{1}{4}$ " x 3'8" Cypress.
- 56 pieces 1 $\frac{7}{8}$ " x 2 $\frac{1}{4}$ " x 3'8" Cypress.
- 4 pieces 2 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ " x 3'8" Cypress.

##### Ends.

- 4 pieces 1 $\frac{7}{8}$ " x 30 $\frac{1}{2}$ " x 2'6 $\frac{1}{2}$ " Cypress.
- 4 pieces 2 $\frac{3}{4}$ " x 4" x 3'5 $\frac{1}{2}$ " Cypress.

##### Paddle Wheel.

- 4 pieces 1 $\frac{7}{8}$ " x 24" x 2'0" Cypress.
- 8 pieces 1 $\frac{1}{2}$ " x 6" x 2'5 $\frac{1}{2}$ " Cypress.

##### Hood.

- 2 pieces 1 $\frac{7}{8}$ " x 17" x 3'4" Cypress.
- 2 pieces 1 $\frac{7}{8}$ " x 10" x 3'4" Cypress.
- 4 pieces 1 $\frac{7}{8}$ " x 9" x 11" Cypress.



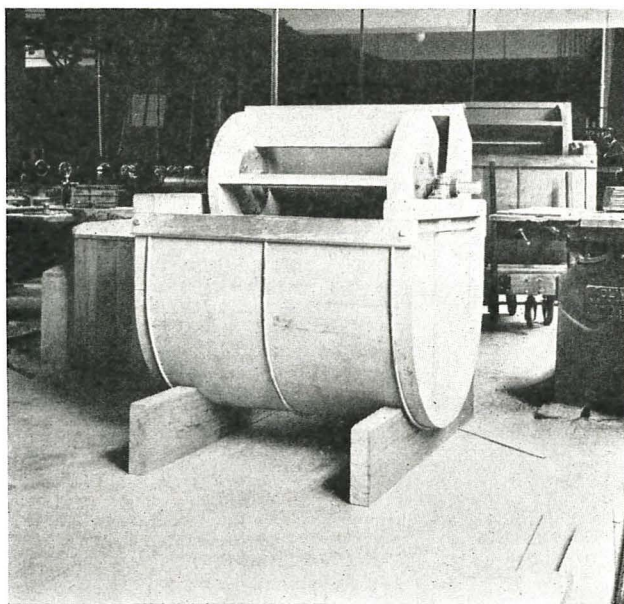


Fig. 4. Tanning Paddle. Capacity, 60 Gallons.

Bolts.

4— $\frac{1}{2}$ "x3'6 $\frac{1}{4}$ "  
 2— $\frac{1}{2}$ "x7'2 $\frac{3}{4}$ "  
 4— $\frac{1}{2}$ "x7'8 $\frac{1}{4}$ "

The entire class was kept on a problem of this kind until actual operations were begun, as the writer believes that every member of the class is vitally interested in this part of the work, regardless of whether he is actually going to work on the particular job or not. When any special or unusual operation is being performed on any or all jobs, the class as a whole is given the privilege of seeing that particular operation. A student deprived of such an opportunity for observation is likely to miss the application of some principle that might be of the utmost importance to him in the future.

Each student is then required to submit an itemized estimate of the cost of construction, labor and material. A tracing of one of these estimates is shown in Figure 3. In order that the entire class should figure on the same basis, the only instructions

given were that they should figure their stock at 8 cents per square foot and at the rate of \$5.00 per day for labor.

Experience is the greatest asset a man can have to help him in sizing up the cost of a job, so it seems unreasonable to expect that a student may at this time, with any degree of accuracy, determine the commercial value of such a job.

Was it worth while asking them to estimate on that job? I think so. In the first place it started them to thinking about their job before they began actual operations; it created added interest and they were alert, watching the progress of the project until completion, and over-anxious at times to know exactly what such a job was worth. An examination of the estimate shown in Figure 3 will show that the student must have put considerable time and thought on the preparation of such an estimate.

The students worked individually, each being assigned to his job as per schedule shown on the record sheet. An order, together with a sketch or blueprint as the case might be, was given to the student at the time the job was assigned to him, with such verbal explanation as might be necessary to start him on his job. He was expected to cut his stock from the rough plank, mill, assemble and finish completely. Then a short time was devoted to checking up their estimates to see if they had attained standards of performance, and incidentally to discuss any point not thoroly understood which might have come up during the process of construction. Figure 4 is a photograph of the completed project.

In all this work of the student which seems to be the more important, skill or principles? By skill, we mean the sharpening, setting and manipulating of woodworking tools; by principles we mean the ability to plan and lay out the work. It seems to me that skill can be developed by constant repetition of the processes involved in any project. Principles are not so easily obtained. A man is hired because

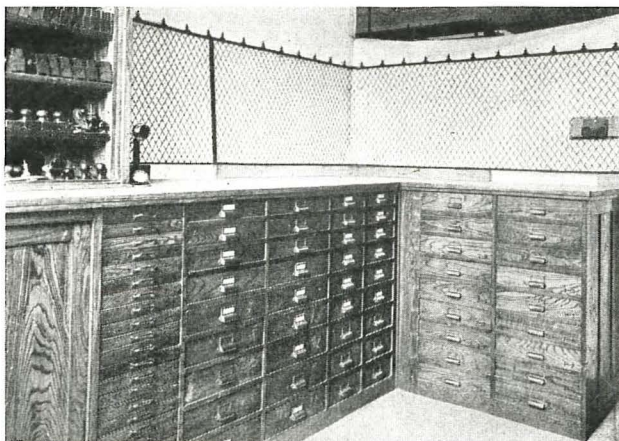


Fig. 5. Tool Room Cabinet erected in the Carpenter Shop.

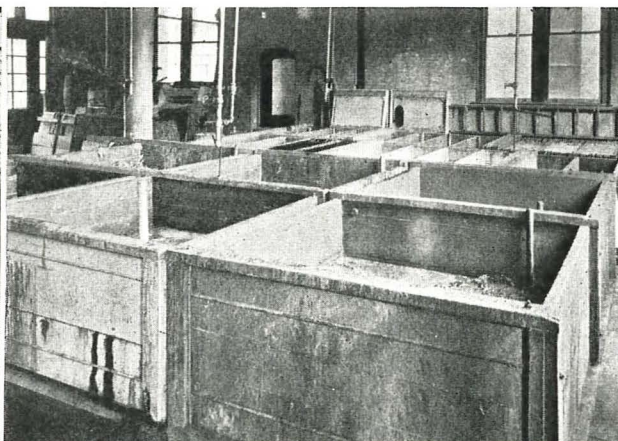


Fig. 6. Tanning Pit erected in the Tannery. A total of 4,700 square feet of Cypress was used in the construction of these tanks.



he knows how to do certain things. The foreman lays the work out, the men under him cut to his line; he doesn't have time to explain to his men what many of those lines mean; in fact, if he did have the time he would be jealous of his job and as a matter of self protection, would keep the men in ignorance.

Skill in itself does not spell for a journeyman rapid progress or advancement in his trade. On the other hand, if he can apply the principles of his trade, can plan his own work, lay it out and develop it, he can demand the highest price for his services,

even tho he be unskilled as far as the handling of tools is concerned.

With the aid of productive work, the school can give a student that which he needs the most and, at the same time, can develop his skill to the greatest degree on the product itself.

Several projects recently completed in the carpenter shop of Pratt Institute, are shown in the illustrations. Figure 5 tool room cabinet, constructed in the carpenter shop; Figure 6 tanning pit, constructed in the tannery.

## STAND-PAT KING-PINS\*

Edward H. Crussell



THE word king-bolt having already been sufficiently explained, I will just say that ordinarily, king-pin means much the same thing, but in the title above, it is used in the slang sense and means the same thing as Main Guy, boss, superintendent, supervisor, etc. It is soon evident that between king-bolts that do not stand pat, and king-pins that always do, a deep gulf is fixed; altho I am going to try, before I close, to trace the cause of the first to the effect of the latter.

Being a rather steady reader in my spare time, and being also deeply interested in all forms of wood-working (manual training and otherwise) I subscribe to a number of magazines of that kind and manage, each month, to read one or two others at our public library. I have noticed that thru a majority of these magazines runs a theme against which I wish to protest. The theme takes the form of a bare-faced assumption, that manual-training teachers as a class:

Haven't any real business or aim in life—

Don't know where they are going, or why—

Ought to be always trying to find out—And above all,

Ought to be always apologizing to the public for their existence and trying to prove to the public that they are doing a real work and have a real place in the educational world.

It is also assumed that if this is not done—and that right quickly—the manual-training teachers will one day find the public arising as one man, to turn them out into a cold world where they will have to *work* for a living. I want to say at once, that among the reasons I have for entering this protest, the chief one is because thus far no one else has seen fit to do so and, if a thing is stated sufficiently often without contradiction, the average person is inclined to believe that no reply is made because no reply is possible. This is especially so, when the thing is stated by people in authority.

The average manual-training teacher is not

\*This title is used with apologies to William Hawley Smith, whose article in the January number of the Industrial-Arts Magazine inspired it.—E. H. C.

likely to make any protest. He naturally thinks it foolish and a waste of time to take any notice of these assumptions. He knows that he is doing all that any human being can do in the circumstances, and that if results are not satisfactory the remedy lies not with him but with the title of this article.

The manual-training teacher is also aware of the attitude of the average parent toward manual training and has no fear on that score. About the only criticisms he ever hears from that direction is, "I don't think the children get half enough of it."

Another reason I have for writing this article is because I would like to see writers (of undoubted ability) turn aside from their unnecessary fault-finding and criticism for a while and offer a little advice on some of the real problems of the manual training teacher's work. Some of these problems are such things as: Pupils in the seventh and eighth grades who have never been in a manual training room before coming in from the rural districts and being placed for manual training in a seventh or eighth grade class that is supposed to be following a regular course.

Another problem is the handling of mixed grade classes—fifth, sixth, seventh and eighth; all the pupils of some small school on the outskirts coming to the manual training center in one class. Usually a class is large enough to make it necessary to put two boys to a bench.

Yet another thing is the difference in size of the classes. A class of seven in the forenoon and a class of 37 in the afternoon, or such things as the eighth-grade classes taking their lessons in the short periods in the forenoon, and the sixth-grade taking theirs in the long periods in the afternoon.

All of these things make problems for the manual-training teacher, problems that he cannot get at the root of, because the reason for them depends, not upon him, but upon someone before mentioned—the Stand-pat King-pin.

Just as it has been, and is, unfair to assume that manual-training teachers as a class are a set of



numskulls who need to be continually reminded of the fact, it is unfair to assume that superintendents and other heads of departments purposely cause these problems merely for the satisfaction of standing pat. If there is anything wrong with manual training the fault is not always the teacher's, and it is very seldom that the remedy lies in his hands.

A personal friend of mine, a cabinetmaker working in the shops of a large railroad company, was once being pestered by a solicitor to take out some insurance. The solicitor had selected the noon hour of the monthly pay-day as the proper time to approach his man, and after having been told that lack of funds prevented the taking of any insurance he said: "But you ought to use some of your income for insurance. What do you do with all your money?"

Said the other: "I have here \$48 (the shops were working short time); at home I have a wife and four children. Tomorrow she will take this money and after she has paid the butcher, the baker and the grocer, and bought a pair of shoes and one or two other little things for each of the children, a pair of overalls for me and a pair of gloves for herself, she'll pack the remainder away in a barrel in the cellar and we use it in the Fall to buy Christmas presents with and to pay the interest on the mortgage."

Now supposing that my cabinetmaking friend had been a manual-training teacher, and one of these so-anxious-to-know people had asked him what his ultimate aim was in manual training work. I can imagine him saying: "Well, you see, this boy comes to me when he reaches the sixth grade. If he stays with me until he graduates from the eighth grade, I shall have had him for a whole hour and a half,

once every week, for forty weeks in the year, for three years, a grand total of 180 hours, or 22½ eight-hour days.

Allowing four and one-half days in the three years for sickness, and sickness is the only thing that will keep him from manual training, that leaves exactly three weeks for us to do the few things we have to do with him in the manual training room.

In that time I expect to teach him:

How to sharpen and set a plane and how to use it.

How to use a chisel without cutting himself.

To use a square and a gauge correctly.

To tell the difference between a rip-saw and a cut-off saw.

To saw and plane to a line.

To measure correctly and to divide fractions of an inch.

To turn the brace to the right when boring.

To cut up lumber without waste.

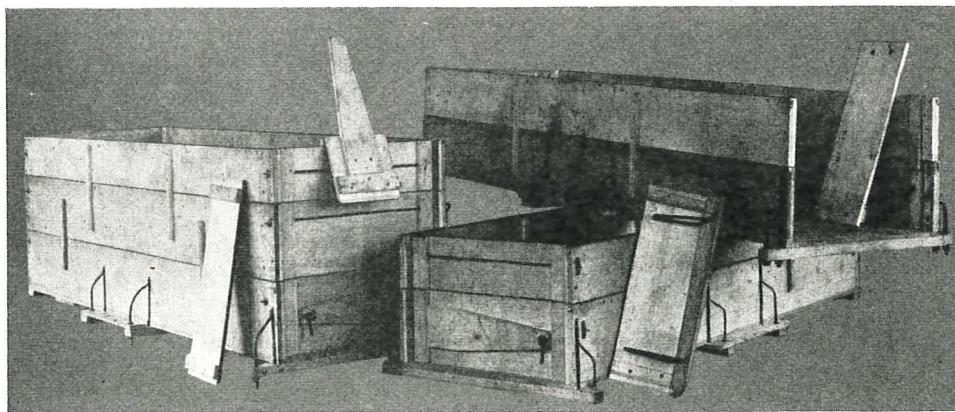
To put the stain on his model and not on the walls or benches.

To put the wax on once and rub it off seven times.

And above all, to keep busy every minute he is in the manual training room.

If he happens to be a particularly bright pupil, and there is any part of the three weeks left, I shall probably have him go out into the woods and fell a tree from which to whip-saw the lumber for his last model.

The foregoing is what my cabinetmaking friend might be expected to say, but I have another friend who sums the matter up in fewer words. He says: "My chief and ultimate aim is to follow, as closely as I possibly can, the ideas of my superior officer."



Farm Wagon Boxes made in the shops of the Northern Normal and Industrial School, Aberdeen, S. D.  
Mr. H. P. Gerber, Instructor of Woodworking Classes.



# Leather Work by High School Sophomores

Elsie MacDowell, South High School, Youngstown, Ohio



LEATHER work is one of the best art crafts for the high school. It affords an excellent opportunity for art expression, it is easily handled, requires a small and simple equipment, and the finished article is so desirable and useful.

ing where a dull leather is desired, and sheep and calf ooze for cut work.

In our classes we use no patterns. The pupils work out their own individual patterns after they have made their designs. They are taught that the first important thing in design is the shape of

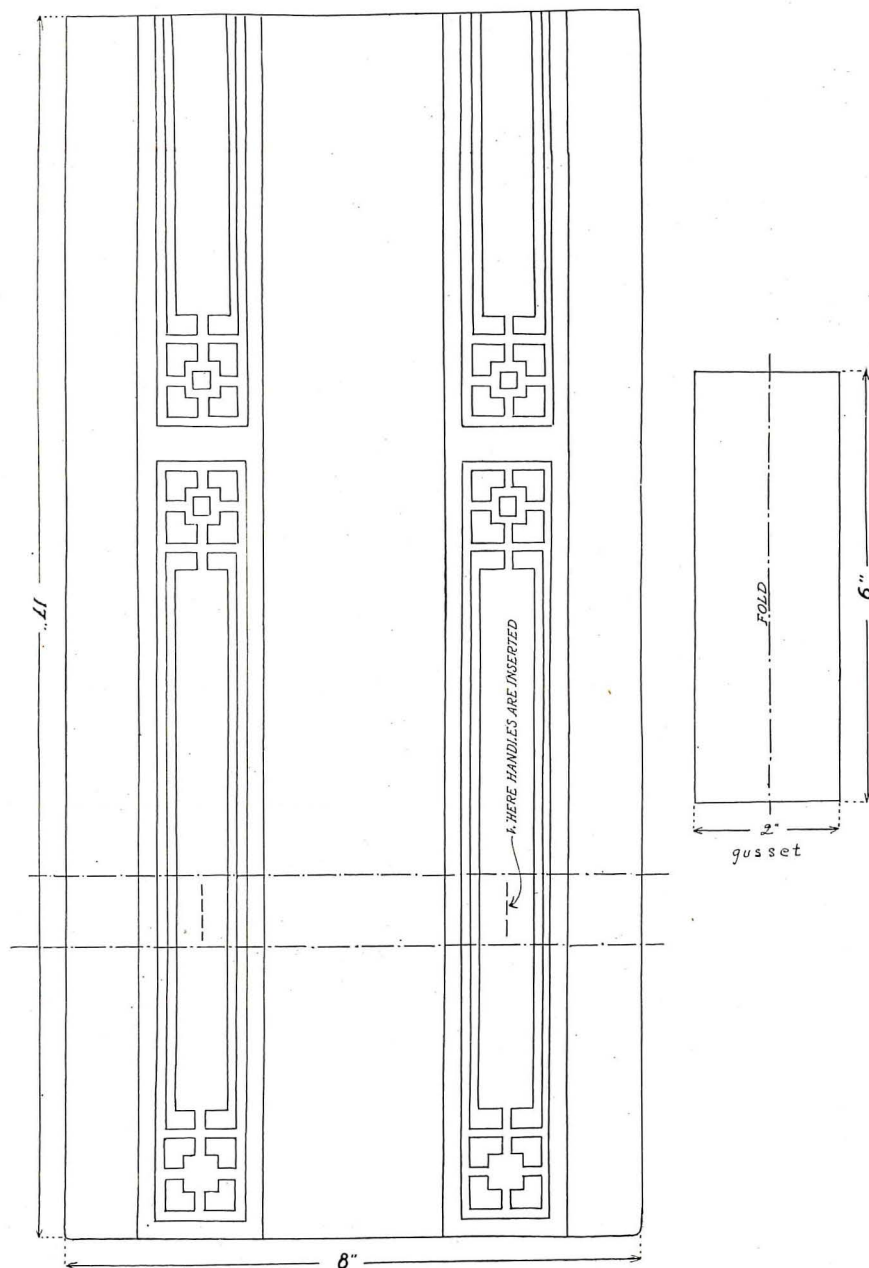


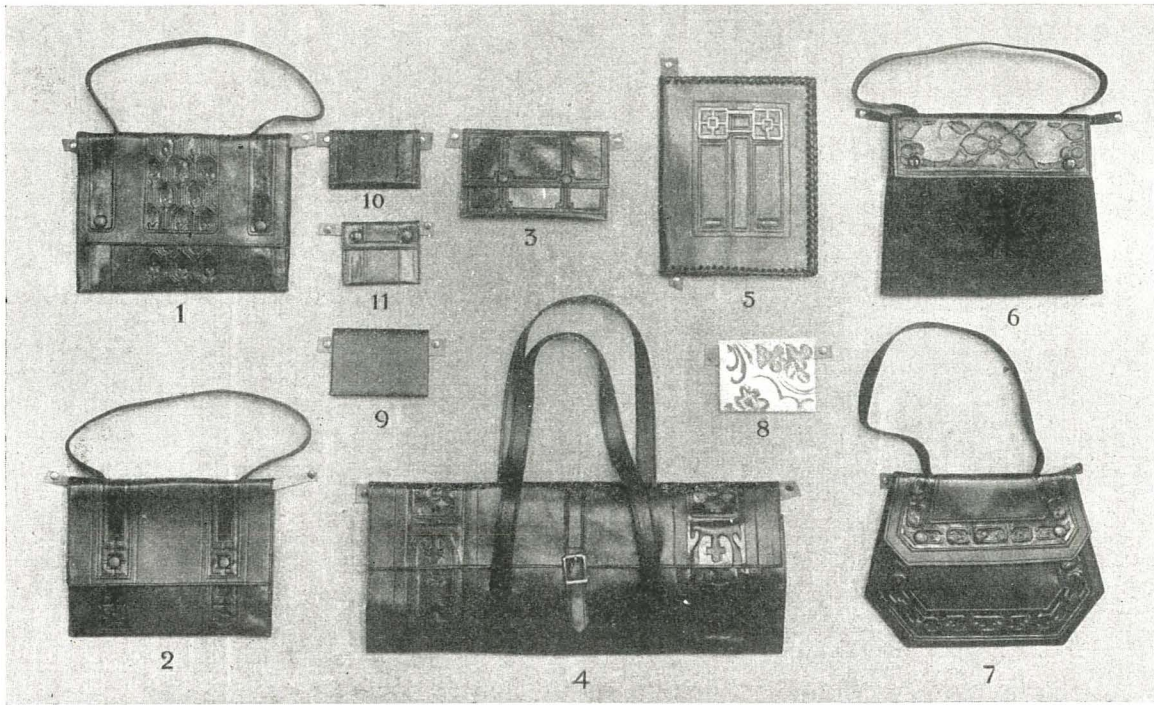
Fig. 2.

Good leather must be used if good work is to be accomplished. For articles that are to have hard usage, Russian calf should be used. It is the most durable leather, and if it becomes shabby or faded it may be scrubbed and re-dyed. Skiver, a thin, inexpensive leather, is best for linings as it is more durable than silk. Cow ooze is best for tool-

the article—it must be pleasing and of good proportions.

A number of thumb-nail sketches are made, the most pleasing one is selected and drawn on squared paper the size the finished article is to be. If it be a bag, the depth of flap is now decided, keeping in mind where the decoration is to be placed.





Figs. 1, 2, 7, tooled leather handbags; 6, black moire silk handbag with tooled leather top; lined with lavender brocade; 5, a portfolio; 3, tooled pocketbook with strap on back; 8, 9, 10, cardcases of leather and silk; 11, coin purse.

After this is disposed of a margin is made by drawing lines parallel to the contour and one-fourth to one-half-inch, or more, from the edge—the width of margin depending upon the size of the article. But-

tons, handles, etc., are indicated as they must become a part of the design. Then the decoration is planned and worked out in full, as shown in Fig. 1.

Now we are ready to make the pattern. This

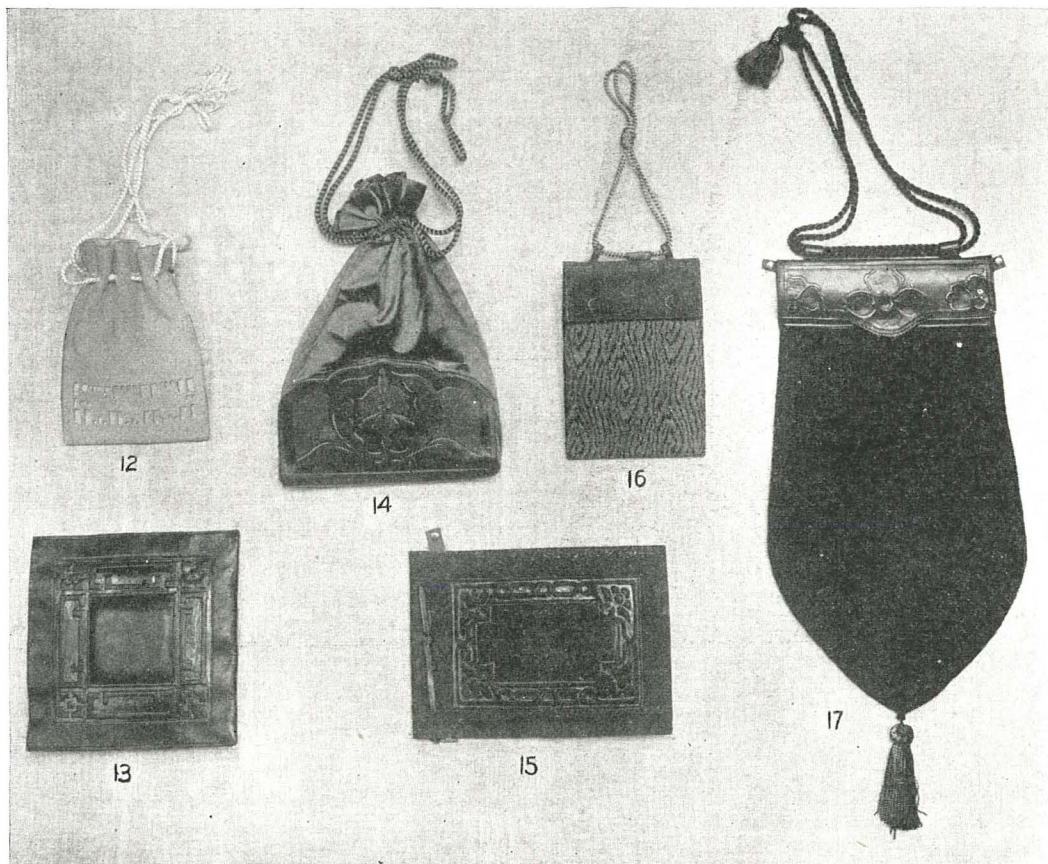


Fig. 12, calf ooze opera bag; 13, gentleman's handkerchief case; 14, taupe silk top, taupe leather tooled and dyed wisteria and dull green, lined with wisteria silk; 15, postcard album of cow ooze; 17, slipper bag of tooled leather and French broadcloth.



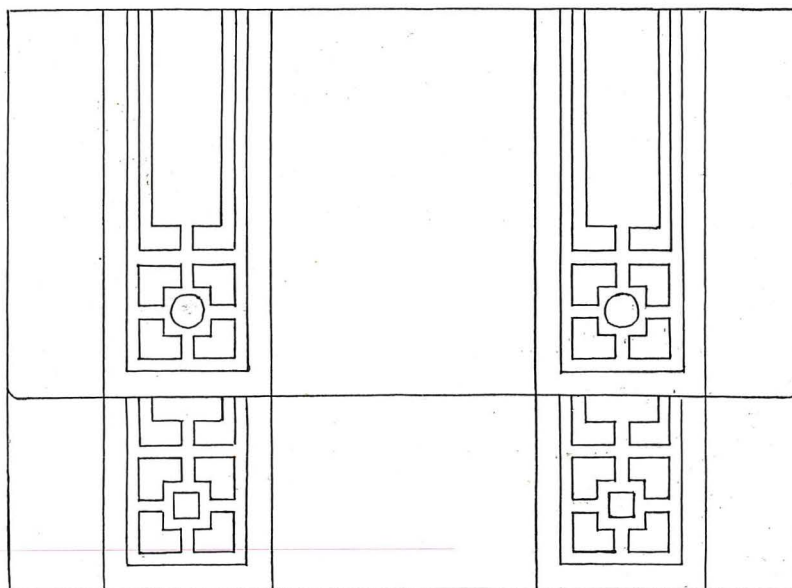


Fig. 1.

is laid out on squared paper as a working drawing, allowing an inch at top of bag where handles are to be inserted. Fig. 2.

Make a tracing of the completed drawing upon rice paper. We are now ready to transfer the design to the leather.

Working in this way the pupils are obliged to do considerable careful planning and we find they become quite self-reliant. In doing cut-work we transfer the design to the wrong side of the skin,

using graphite or carbon paper, and cutting with a very sharp knife.

We are very careful with the sewing and finishing off. When the sewing is done on a sewing machine six-inch threads are left everywhere. Using a fine needle these ends are sewed back and forth thru the machine stitches to some distance from the edge where they are brought out between the edges of leather and tied off. When finished in this way the work is secured against ripping. The edges are carefully colored to match the shade of the leather.

## Practical Correlation of School Art and Home Gardening

Jennie M. Haver, Art Instructor, Clinton, N. J.



IT'S everybody's business  
In this old world of ours,  
To root up all the weeds we find  
And make room for the flowers,  
So that every little garden,  
No matter where it lies,  
May look like one God made  
And called it Paradise."

One of our leading Art lecturers is fond of saying that a child's creed should be: "I will lead a beautiful life and therefore I must work; and my work which is necessary shall be as good as I can make it, so as to add to the beauty and happiness of living."

The child is born with an instinct for happiness but left to himself does not realize that work and happiness are synonymous. He needs a few enthusiastic leaders to show him that honor and happiness lie at the end of work that has been well done.

Gardening combines not only work and happi-

ness but health as well. School gardens were not practical in Clinton, the school grounds were limited in space and no other land was available. Nearly all the pupils came from town homes built on spacious lots or from the surrounding farming country. What would be more consistent than to encourage each child to have a home garden of his own?

Early in the spring of 1915, the art teacher becoming enthusiastic over her own beautiful perennial garden wished to pass the gardening joy along. At the close of each drawing period in the grades she would have an informal talk about gardens. When the pupils had reached the proper degree of enthusiasm she told them that, if they would make and care for gardens of their own, small money prizes would be given in the fall to those who brought the best flowers and vegetables to a school exhibit. Money prizes were offered because school garden work being a new thing in the school, it was thought best to give the pupils something concrete to work



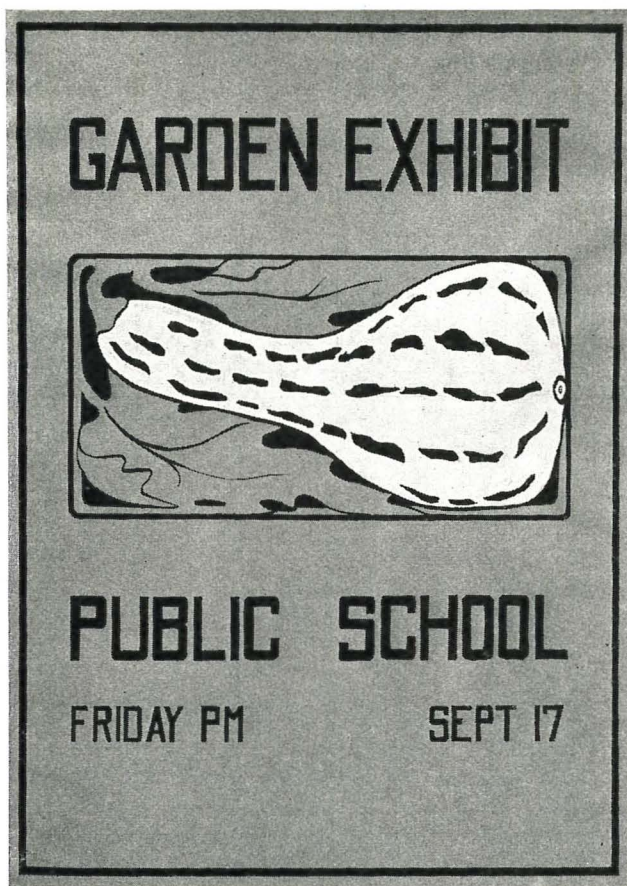


Fig. I. Poster Designed to Announce Exhibit.

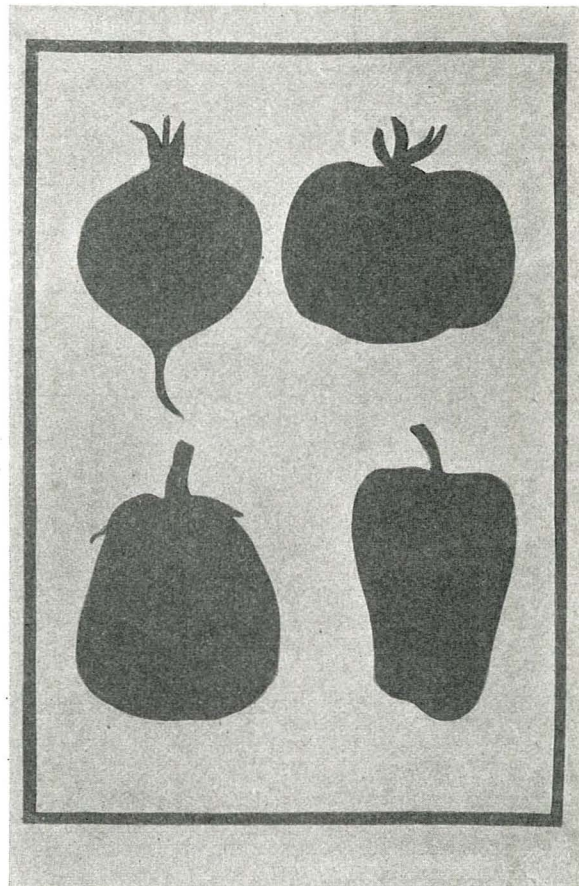


Fig. II. Cut Paper Work from Grades II and III.

for. Hot summer days were coming when the interest might wane if there were no definite goal at the end.

Almost all of the seeds were purchased from a School Garden Supply house at a cent a package. Each pupil was at liberty to choose what seeds he wished. Simple cultural directions were informally given during the semi-weekly drawing periods.

Later in the spring the teacher was greeted on her rounds by scores of raised hands in each classroom.

"My radishes are up."

"The chickens ate my lettuce."

"I planted corn two weeks ago and it isn't up yet. What is the matter with it?"

The gardens were to be planted and cared for by the pupils. Many of them were accustomed to taking short trips during the summer so all were given permission to ask some one to water and care for their gardens the week or ten days they were away.

In June book covers were made to hold the garden records and a short composition entitled, "My Experience in Gardening." The covers were decorated with designs made from flowers, vegetables and garden implements.

A week before the September exhibit the pupils from the second to eighth grades were asked to think how they could help improve the town of Clinton.

They were encouraged to ask their parents, friends and business men for ideas. Two days before the exhibit a language period was devoted to writing a paper entitled, "How I can Best Help Improve Clinton."

The Garden Exhibit was held in one of the grade rooms on September 17th. The tables were built by sixth-grade boys from packing boxes and waste lumber from the basement of the school. The tops were covered with green burlap.

The vegetables were placed on paper plates and arranged on a long table of their own. The cut flowers were placed in fruit jars, pint jars, or jelly glasses, according to the size of the individual exhibit. The pupils carried their flowers to school in the glasses of water, thus keeping them in perfect condition.

The prize list was made out after all the exhibits were arranged. No prize was given unless there were at least three contestants for it. This year no prizes were given for individual gardens because some of the pupils lived seven or eight miles from the town and it was not practical for the judges to visit all the gardens. One prize was given for the most unusual exhibit for this section of the country. In this group were peanuts, sweet potatoes, flax, cotton, grape fruit plants and kaffir corn.

Paper white narcissus bulbs were given to each



contestant who failed to receive a money prize. The children were delighted to get them, particularly so, when a picture of one in bloom was shown and the promise given, that if the bulbs had proper care, each would bloom just as prettily by Christmas time. Many of the vegetables were left after the exhibit to be used as drawing models. In the primary grades the single vegetables were used in paper cutting and crayon drawing. Groups of two or three were treated in a decorative way in the fifth and sixth grades and in the seventh and eighth grades

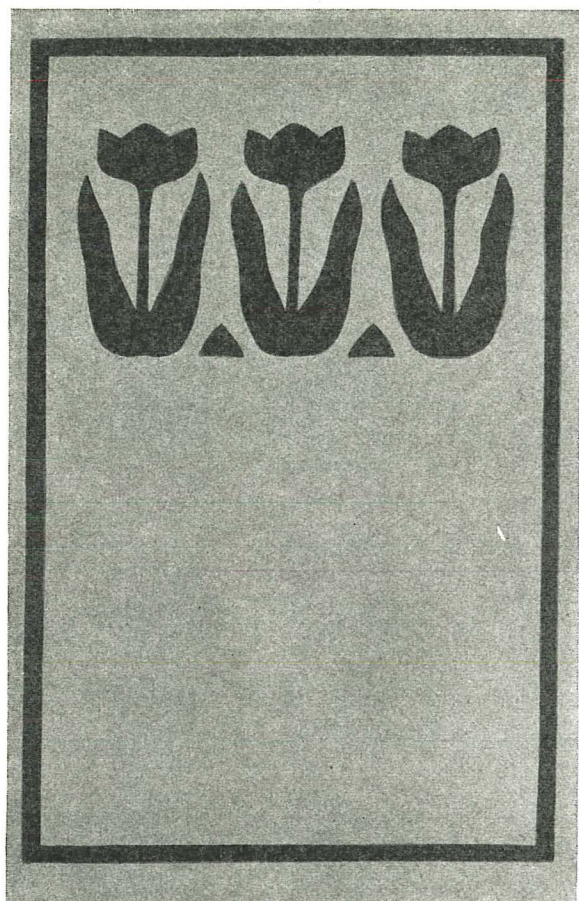


Fig. III. A Tulip Design Developed in Cut Paper Was Used to Decorate This Fourth Grade Booklet.

the groups were used with the addition of a kitchen utensil or a piece of pottery.

Did the home gardens pay? Yes, a hundred-fold. The eager faces of the children told their own story of happiness found thru work. The brilliantly colored vegetables and beautiful flowers proclaimed to all that even little children can do much to add to the beauty of the world. The practical was not forgotten either for the art instructor heard of many delicious vegetables and more than one luscious melon eaten from those same home gardens.

Many sick people had their weary, pain laden hours brightened by bouquets from the little gardens and the children learned in such a beautiful way the

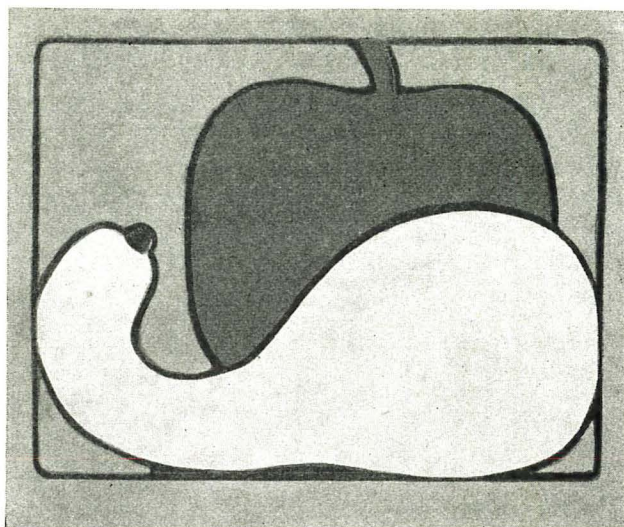


Fig. IV. The Fifth and Sixth Grades Were Much Interested in Making Decorative Studies of the Brightly Colored Vegetables.

words of the Great Teacher, "It is more blessed to give than to receive."

Deep down underneath the surface results is one of far greater consequence. Every country town in order to be truly alive and progressive needs to develop a community consciousness. There is no quicker way of bringing this to life than to make each impressionable child realize that he is not only an important factor in his own home but also in his own home town.

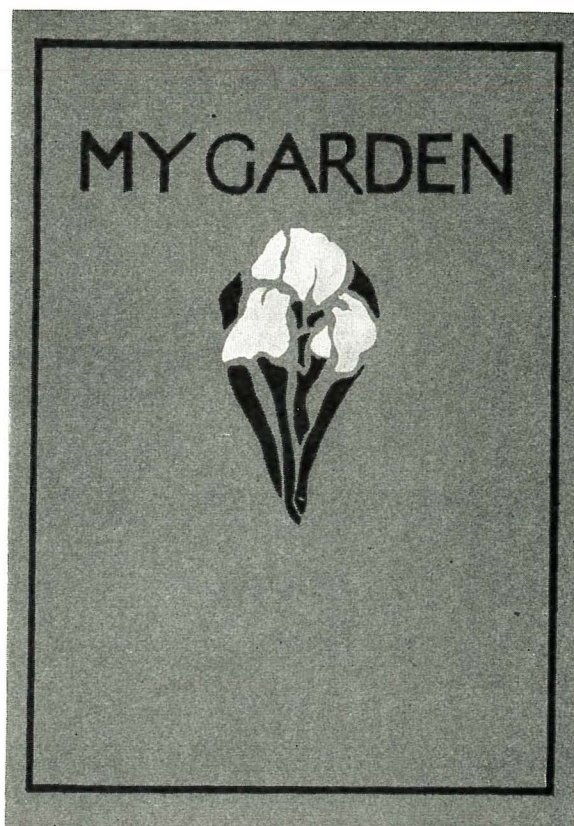


Fig. V. Do You Wonder That the Children Loved Their Gardens and Their Garden Books!



The following essay speaks for itself:

"How I can Best Help to Improve Clinton."

"Clinton is a very pretty little country town but I can make it much prettier by keeping my own home in order, and by keeping the lawn trimmed and the walk in front of our house clean. Every Saturday morning I mow the lawn with a lawn-mower and turn the hose on the porch and on the walk.

"I pick up all the papers from the lawn and street in front of our house and burn them in the kitchen range.

"I do not mark the walks or buildings with chalk or anything else. If I see little folks marking anything I tell them to stop.

"This year I planted morning glory vines by our back porch. They grew clear up on our roof and looked fine. Next year I am going to put them by the front porch too. I had asters, pansies, sweet alyssum and nasturtiums in the back yard. I planted some flowers in a vacant lot near home and they bloomed. I think that helped Clinton.

"I am not going to spit in the street. Our school hygiene book says that awful disease germs spread that way. The spit dries up and floats in the air like dust and then gets into some nice little baby's throat.

"I will visit all the homes along the river and ask the people living in them not to throw ashes or tin cans out on the river bank. It does not look nice when we go out boating. I will also ask the storekeepers not to throw their old boxes out on the left bank of the river near the Main Street Bridge.

"I will try to get my father and big brother to

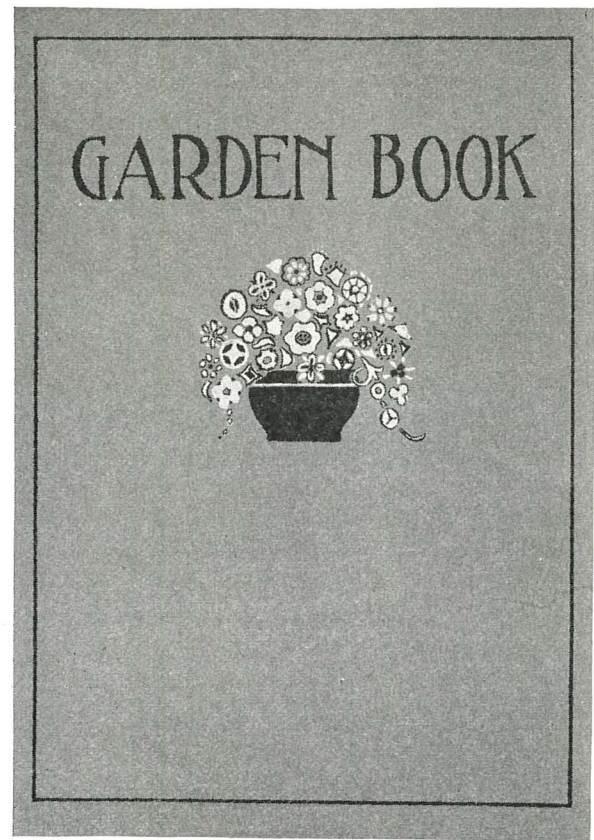


Fig. VI. A Garden Book Like This Should Hold Many Happy Memories.

vote to have the saloon closed. One of the best ways to help Clinton is to get the whiskey out of it.

"I will help all I can with the Y. M. C. A. The leaders there are trying to make us into good citizens and good citizens will improve Clinton more than anything else."



Fig. VII. This and the Following Snapshot Were Taken by one of the Young Exhibitors.

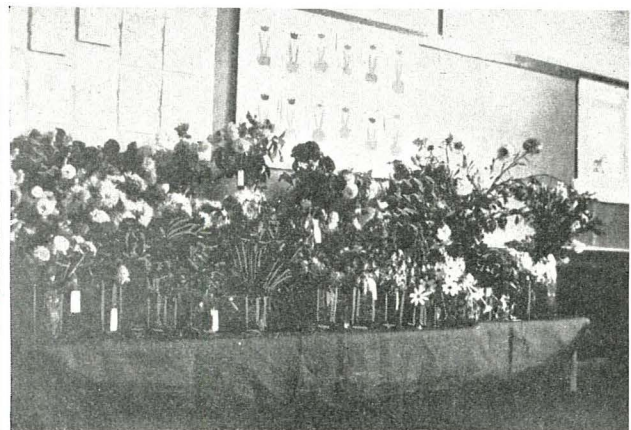


Fig. VIII. The Flower Tables Were a Center of Attraction.



# Decorative Stitches and Their Application

Pearl Salter, Chicago, Ill.



It is a recognized fact that no longer can any form of handwork be separated from design; to accomplish the best results they must go hand in hand. In planning a course of study in any branch of handwork either in the grades or the High School, it is imperative that it be suited not only to the every day life of the children at home, in school or society, but that it be made attractive as well as practical. Just as soon as a child learns to construct a useful article, his happiness becomes two-fold, if he is allowed to decorate it in some way. Even in the primary work of paper construction, coarse sewing, raffia and basketry, design should not be overlooked. When the fourth grade is reached the boys usually start manual training and the girls sewing. The methods of decoration are numerous of course, and vary according to the kind of work being done, but in domestic art work in all the grades it is achieved by the use of decorative stitches. No definite rule can be laid down for placing either a stitch or an article in a certain grade. As the same problem is often presented in different grades, the manner of making constitutes the difference. In introducing the various decorative stitches, it is assumed, of course, that the article is itself of good proportion, design, etc. Tho the same stitch is often appropriate for a wide variety of articles, I have seen instances where a little more forethought would have presented a far different effect.

Among the simplest and most commonly used stitches are the chain, herringbone, feather and blanket. Before hemming is learned the chain stitch is one of the first to be taught as it serves the purpose of both ornamenting and holding the hem of the dust cloth, bag, face cloth or whatever the first problem presented may be.

The single feather stitch, tho more difficult than the chain stitch, serves about the same purpose and is applicable to many of the same articles, traveling or shirtwaist cases, aprons, caps, bags, etc. Canvas is an aid in teaching it to children, the squares serving as a guide for them to work by. The really fine feather stitching, be it single, double or triple, requires more experienced fingers, since the width and relation of one stitch to another should always remain the same. Combined with drawn work, it is especially attractive for children's clothing, towels, and table linen. A rather unusual apron, on which feather stitching is most useful and appropriate, is made of linen crash toweling combined with a small figured cretonne. The body of the apron is made of the crash, fitted by darts at the waist line. Across the bottom is one large pocket made of cretonne,

subdivided by feather stitching into smaller divisions. The pocket is higher at the center. A scissors and handkerchief pocket and shaped belt are also made of the cretonne and decorated with feather stitch. Individual ideas can be worked out in both the design and the color scheme.

The blanket stitch is introduced early and is well adapted to many simple articles which the child delights in making, viz: Doll's blanket, comforters, holders, book covers and baby wear. Because of it the flat buttonhole is more easily applied a little later on, in scalloping, tho here particular stress must be laid on the shaping and evenness of the stitches. An outline which I have found satisfactory in teaching children to scallop towels, making each step their own, is here given:

## To Scallop Towels.

1. Even off the edge of material.
2. Plan space.
3. Mark the distance from the edge with:
  - a. tracing.
  - b. fine basting.
  - c. lead pencil.
4. Scallops worked with different sized buttons and coins. (Plan scallop to come in the center; make one line and drop coin to make the second line.)
5. Padding (soft cotton 50 or 60).
  - a. Use long and short stitch (short on the under side).
  - b. Use chain stitch (not as desirable).
6. Hold as for hemstitch; sew left to right and let thread be under the needle always. Work toward you with threads towards you. The finer the cotton used the closer and firmer is the scallop. Keep stitch straight but shape to scallop. On cotton goods, do not cut edge until after laundering. On silk or other material press before cutting out. On center pieces, table linen, etc., trim edge to within  $\frac{1}{8}$  inch or more of worked edge of scallops, turn back and hem down. A strip of material basted to the edge often simplifies working where scallops are close to the edge. For children have scallops all the same size.

As a rule children are very fond of hemstitching. The first problems should be on a rather coarse, loosely woven material such as crash, to allow for the easy removal of threads. Care must be directed toward instructing the children not to cut the warp thread. There are several ways of hemstitching but the strongest and the most satisfactory is to work left to right, fastening the thread on the wrong side, without knot. First take up the desired number of threads, and draw the needle thru; repeat and insert the needle in the fold of the hem. Draw the thread tight to separate clusters. In the more advanced work it can be developed into a number of complicated problems since hemstitching is the basis for much drawn work.

Assuming the student has by now scalloped or hemstitched a towel, centerpiece or table runner as the case may be, his next interest lies in learning how to embroider. Perhaps in her art work, she has made the design appropriate for her especial piece of work. Very young children do a simple design



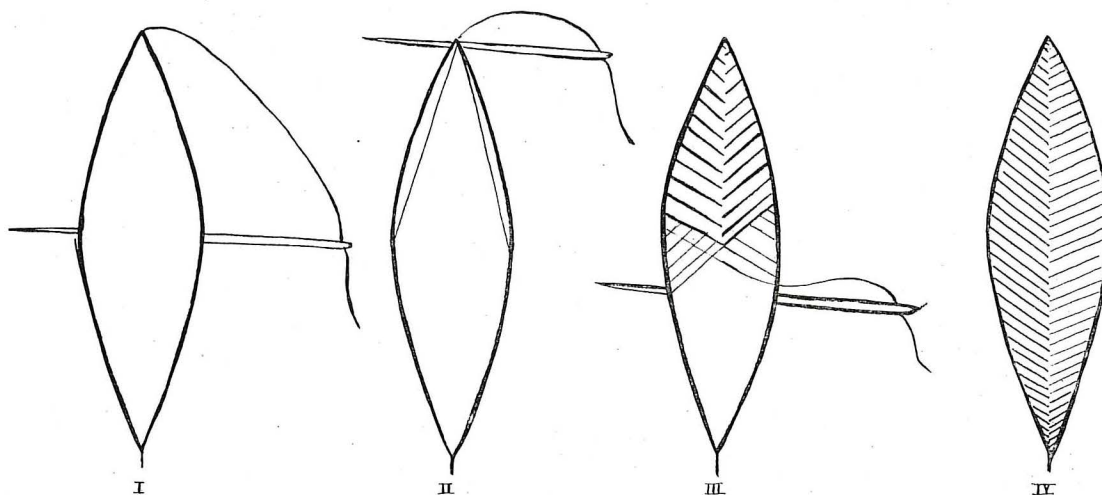
## SELF-PADDING STITCH.

FIG. I FIRST STITCH.

FIG. II SECOND STITCH.

FIG. III PARTIALLY WORKED.

FIG. IV FINISHED



first in Kensington, or outline stitch. Next, using a rather small leaf or flower in the design, the solid work, employing the satin stitch, is generally taught. As a general rule this must first be padded, where either the long and short or chain stitch is again brought into use. The padding must always be done in the opposite direction from the satin stitch. Solid work requires both patience and practice to acquire that evenness which is so essential to a good appearance. It is worked both sloping and straight across the figure.

For the beginner the self padding stitch works up quickly, as well as most effectively, and is suitable for larger leaves, petals, etc. For this work a rather coarse and twisted floss is better suited. The needle is brought up on the right side at the apex of the petal (leaving an end long enough to be caught under work on the wrong side for fastening) and the first stitch is taken across the petal at about the center. This is followed by a second stitch parallel to the first but taken at the top of the petal, the third below the first and very close to it, the fourth below the second and so on, carefully following the outline until the petal is completed. To fasten the thread run it under the work on the wrong side.

Other stitches occasionally used are the wheat, braid, and lazy daisy, each being fitted to its own particular design. The lazy daisy is the simplest and most commonly used, and is worked with two or three strands of fine embroidery thread. The needle is brought up on the right side, at the stem end of the leaf, and is put thru to the wrong side close to the point where it was brought up, but leaving a

small loop the length of the petal, which is caught down at the apex of the leaf by a single stitch. Baskets of small flowers using this stitch and French knots is the usual combination, and is much used on the ends of towels. The braid stitch is more for conventional work.

Eyelets, as a rule, are much used in embroidery work and tho simple in construction, require some little skill in making well, which, however comes with practice. There are three kinds;

1. Worked with over and over stitch (most often used).
2. Buttonhole stitch with edge toward the outside.
3. Buttonhole stitch with the edge toward the inside (mostly used for cord lacer in outing flannel).

A round eyelet must never be cut, but punctured with a stiletto; an oblong one is cut. In using the stiletto, hold the goods firmly and make the hole with a spiral motion of the stiletto until the size desired is made, and work with one of the above stitches. A row of running is often run first around the stamped circle. In making a group of eyelets it is not always necessary to break the thread each time; tho if the material is double, run the thread between the thicknesses.

When the student comes to the actual and all-important construction of a waist or dress, she will doubtless be eager to learn smocking, which is much in vogue at present. For this a soft, easily creased material is to be preferred. Crossbar dimity is good if the design is regular enough to be used in

place of stamping. The smocking must be done before cutting out the garment, just as with tucks, plaits, etc. The designs are most simple and easily made by the individual, offering a good opportunity to show the student's accuracy. The dots are made in parallel rows on the wrong side of the material, about three-eighths of an inch apart. The best results are obtained by running a basting or gathering thread across each row, using the long and short stitch (long on the right side). Some omit this step, but a more even effect is obtained, I believe. From three to four times the width is necessary for gathering. Then the first and second, third and fourth, gathering threads are tied together, great care being exercised in keeping the dots or plaits evenly spaced. The simplest stitch, the outline, forms the basis for nearly all others and is worked from left to right. Bring the needle up on the first plait on the right side of the material, and take one stitch in every plait, always with the thread below the needle. The Vandyke is one of the prettiest, however, and looks well combined with one or two rows of outline stitch on either side as a border. It is worked from right to left. The thread is brought up on the first plait in the center of the space between the two rows of basting, and a stitch is taken thru the first and second plaits together, repeat, and then catch the

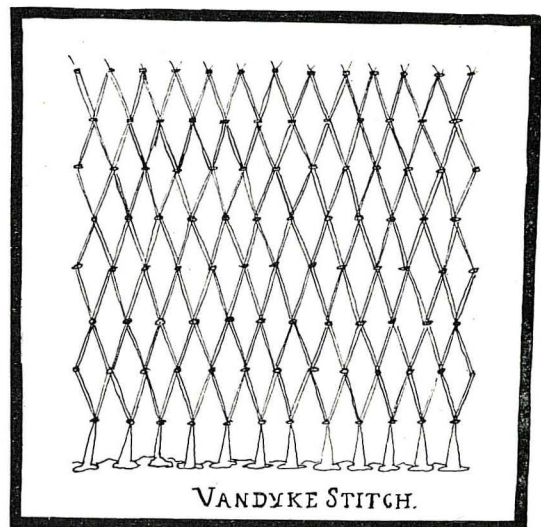
second and third plaits together, but on the row of dots below; repeat, and continue to the end, using the third and fourth next (between rows of basting) fourth and fifth on rows of dots, and so on. This forms a diagonal. Bastings are removed when the smocking is completed. There are many others, the diamond, cable, wave, etc., and a very pretty effect may be obtained by original combinations in both design and color. For the pointed effect in smocking (used largely on children's clothes) make two or three rows of the same number of dots, then drop off two on each end of each succeeding row in making the design.

For class instruction on any of the above stitches, where a blackboard either is not available or is not best for a clear illustration, a wooden frame on which is fastened a piece of canvas serves to show the stitches for the first instruction. For this the instructor should use a heavy, coarse thread or wool of a contrasting color. Later, of course, individual help is usually needed by some of the pupils.

This is only a brief outline, as it were, of the decorative stitches, with their relative values to Domestic Art Work but their use has always been found most helpful for engaging the attention and interest of the pupil.



SMOCKING





# Shoe Cobbling in the Manual Training Shop

J. L. Kerchen, Director of Manual Training, Portland, Ore.



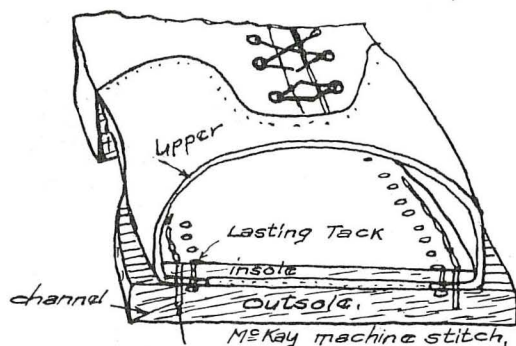
ABOUT three years ago, in an effort to correlate more closely the work of the manual training shop and the life of the boy, an experiment was made in Shoe Cobbling. To test the project thoroly one shoe cobbling outfit was installed in three of the manual training shops of the city. One of these shops served patrons typically industrial; one was located in a district very prosperous; and one in a district not decidedly much either way. The response was so immediate and the interest so intense that its success from the start was assured. Nearly all the boys in the shops—whether they possessed much manual dexterity or not—"Took a try at it," so to speak. It offered variety, tho not "infinite," for a change and this was "spice" on the wood and metal work already given.

The style of bench shown in the accompanying illustrations have proven very successful here.

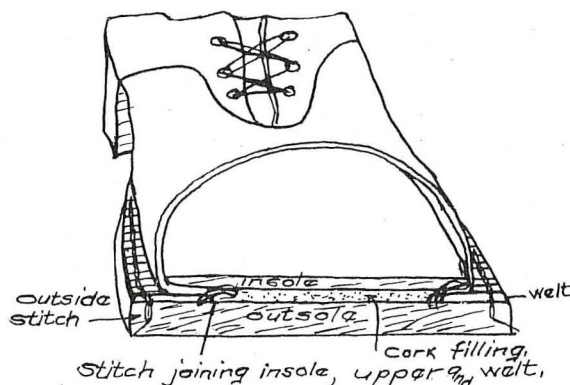
Exclusive of the bench, the approximate cost of the above equipment is \$3. It has been found ample for the requirements of an average manual training shop. The expense of this equipment can be materially reduced by making the patterns and having the shoe lasts cast in a local foundry if such exists in your community. In this case six or more of the medium sized lasts, so made as to fit into the ordinary manual training vise, is a very desirable investment. This enables more than one or two boys to work at a time, which emergency sometimes arises.

## Method of Handling

No definite specified time allotment is provided for cobbling in the shop schedule. The work is a privilege for the boy and in no sense compulsory.



CROSS SECTION  
McKay Sewed Shoe.



CROSS SECTION  
Goodyear Welt Shoe.

## Equipment and Cost.

In the fall of 1913, the following equipment was placed in each of the manual training shops of the schools:

- 1 shoe bench (made in shop).
- 1 set assorted shoe lasts.
- 1 shoe knife, round nose.
- 1 shoe knife, square nose.
- 1 edge iron, for finishing edges.
- $\frac{1}{2}$  dozen pegging awls.
- 1 shoe hammer.
- 1 shoe stretcher.
- 1 pair shoe nippers.
- 1 shoe rasp.

The shoe bench should be strong, substantial and portable, with plenty of drawer room provided for holding all the nails and tools that belong to the shoe outfit. It can be made an excellent wood-working problem for the more advanced students.

Whenever a boy's shoes or those of his parents, brothers, sisters, cousins, or aunts, need repairing and the work can be done in the shop, he is encouraged to do it. The shoe equipment is usually ready for use from 8:20 A. M. till 4 P. M.

Tools, shoe nails, dyes and heel plates are furnished to the boy free of charge. The boy provides his own leather for the replacement of his heels and soles. The leather is usually purchased by the instructor in amounts justifying reduced rates, and then sold to the boy at approximately cost price. At times the boy can secure old belting or scrap leather in the way of odds and ends, from junk and second-hand dealers at a greatly reduced rate, tho in general it pays to procure the best materials and the student is usually advised to do so.

The work is carried on in addition to the regular shop program and very seldom interferes with it. It has not reduced the amount of woodwork, me-



chanical drawing, or metal work done in any manual training shop.

#### What is Actually Taught.

Heeling and half soling are all that can be attempted with our present equipment. A few of the more enterprising teachers have tried cement patching but thus far little interest is shown in this phase of the work. Neither has there been made as yet an effort to do hand sewing tho it is felt that much could be made of this in cases where the student possessed more than ordinary ability.

Unless the pupil is somewhat mature and skillful he is not encouraged at the beginning of his manual training work (in the fifth grade) to begin shoe cobbling. On the whole a boy should have one year of shop experience and be somewhat developed before beginning shoe repairing. Putting on a half sole does necessitate a certain amount of hand control and concentration of mind to do an acceptable "job," therefore it is advisable not to permit the boy's enthusiasm to run away with his judgment.

It is usually taught in this wise: At some convenient time in the upper sixth grade, to the class as a whole, a demonstration is given on the structure of a shoe. Following this, the preparation of the leather and the actual placing on of a heel and half sole is shown by the teacher. Below are sketches of shoe parts used in the teaching process.

Of course, in order not to miss any of the pedagogical values of correlation, the stories of the different kinds of leathers, their preparation, tanning, etc., are told. The proper use of tools, dampening and beating down of the leather, nailing, cleaning, burnishing, trimming, rasping, et al, that pertains to the work in hand is duly emphasized.

One of the by-products of this instruction is the resultant interest in the proper treatment and care of shoes. Much money is lost because of lack of knowledge in this matter, "a stitch in time saves



An Interested Worker.

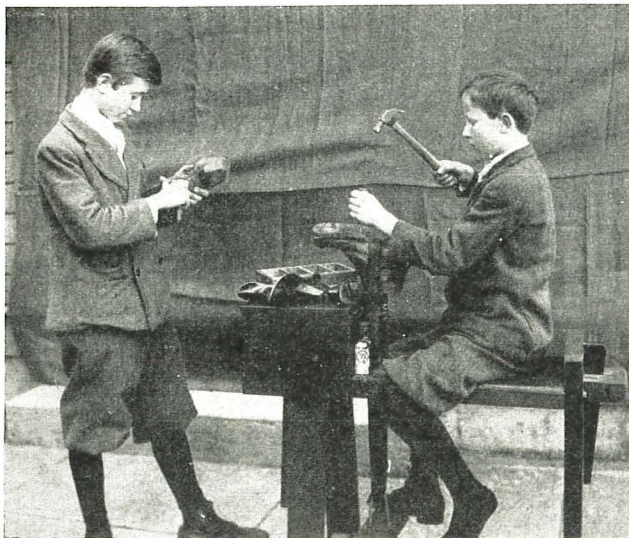
nine" is especially true in the case of shoes beginning to wear. To know when your shoes fit, when they do not and why they do not, when hand sewn or machine sewn, McKay sewn or welted is all knowledge well worth while whether one ever repairs a pair of shoes or not.

#### Preparation of Teachers.

Naturally the question will arise, What about the preparation of teachers for this kind of work? Among nearly any shop force of men there usually will just happen to be one or two teachers who can cobble shoes. Make the most of these. On some opportune Saturday morning have a meeting of all the shop teachers. Let each one bring along a shoe that needs a new heel and a half sole. Under the instruction of the "one that knows" actually put on a heel and half sole. This will be practically all the immediate training necessary. In case there is no "shoe expert" on the manual training force invite some cobbler to come to your shop and demonstrate the method of soling and heeling. Do not miss the chance yourself to do the work under his instruction. With this start, and a few of the necessary conveniences for thinking and doing, no further trouble may be surmised.

#### The Saving to the Boy.

Economically determined shoe cobbling makes a very strong appeal to the boy who has to "count



Two School Cobblers.



his pennies," as it were. Here is one place where his work really has a money value. For example: The net cost to the student of heeling and soling a pair of shoes in the manual training shop is from 20 to 35 cents. In the average outside repair shop the same work will cost from 75 cents to one dollar. This represents a net saving of from 50 to 75 cents. This without many other values is an excellent reason for its existence.

#### Interest.

Shoe cobbling has proven interesting to the boys here, first, because what they do is financially worth while; second, the spirit of adventure, the trying something new is always alluring to youth and, contrary to what might be expected, the work has been popular in some of the most prosperous districts of the city; third, the work in itself has much inherent craft content. A well executed piece of shoe repairing challenges the boy's skill as a craftsman as much as any problem in wood or metal. Seventy-five per cent of the boys have made use of these outfits.

Last year, just previous to the holidays, literally

hundreds of pairs of shoes were repaired in the manual training shops for the poor of the city. These shoes were contributed by charitably inclined persons to the social organizations which in turn sent them to the shops, where they were repaired by the manual training students free of charge. The school in these cases furnished the necessary leather.

#### Literature on Shoe Repairing.

There is not an abundance of literature on the subject of shoe repairing. The most simple and to-the-point book of which the writer knows is "How to Repair Shoes," by Frank L. West, head of the shoe making division of Tuskegee Normal Institute. This is well illustrated and contains no superfluous matter. Another good work is "Boot and Shoe Making and Mending," published in the Handicraft Series by P. N. Hasluck. A yet more descriptive work than either of these is "A Manual of Shoe Making," by William Dooley. This book is an excellent exposition of the methods of making the modern factory shoe. All of the above books are intelligible to the average reader.



Class in Cobbling, Palmer School, Springfield, Ill. A. B. McCall, Instructor.



# BRICKLAYING—AN INDUSTRIAL ART

Wm. T. Gohn, Philadelphia

Article VIII—"Ornamental Brickwork"



AN account of the great variety of shapes and sizes obtainable, the *art of bricklaying* gives a broad scope to the ingenuity and skill of the designer. Mortar joints should not be hidden, but made prominent enough to be perceptible from a distance. Especially should this be so where some apparent bond is employed.

A good rule to follow is to produce a corresponding texture in the mortar joint as is found on the face of the brick itself. It would be quite irrational to flatten the texture of a rough finished brick by the use of a smoothly finished joint, and vice versa. Where joints of a color corresponding to that of the brick are used, they should be treated in such a manner as to cast a shadow in order that they may be of some prominence. On the other hand, where there is a contrast in colors, a flush joint is the more desirable.

Even a straight wall can be made a work of art, if careful study is given to the bond and the color scheme.

Under the head of "Ornamental Brickwork" are included panels, pilasters, cornices, geometrical and other intricate designs, and the more elaborate curvilinear work.

Panels are decorative features of brickwork where the main surface recedes somewhat from the general surface of the wall, or they are superficial

areas having raised or projecting margins. They are generally used to relieve what would otherwise be a monotonous surface. Figures 1, 2, 3 and 4 illustrate four different designs of panel construction, and, I should say, in the order of their intricacy.

Figure 1 is a problem of inserting a panel in a wall, where the design of the panel is nothing more than a diversion from the bond used in the main wall surface.

The margins enclosing the panel consist of two courses, the outer one being of "Row-locks" or brick on edge and the inner one being of "Flemish Bond," the same as is used for the main surface of the panel.

The main object in this, as in all panel work, is to carry the lateral margins in a plumb or vertical line and that the entire margin shall show the same reveal around the entire panel. Where the bricks composing the panel are of a like shade to those of the general wall surface, the panel may be accentuated by the use of a different shade of brick for the margins.

Figure 2 shows a small panel involving a somewhat intricate geometrical design, and introducing a combination of shades. This panel is enclosed by a margin of whole brick, in which the *horizontals* are laid up with "soldier courses," while the *verticals* consist of stretchers laid directly over one another in plumb lines. Great skill and care should be exercised, whenever small units have to be cut and shaped to an exact size by the bricklayer, and the same should apply to the execution of laying up the

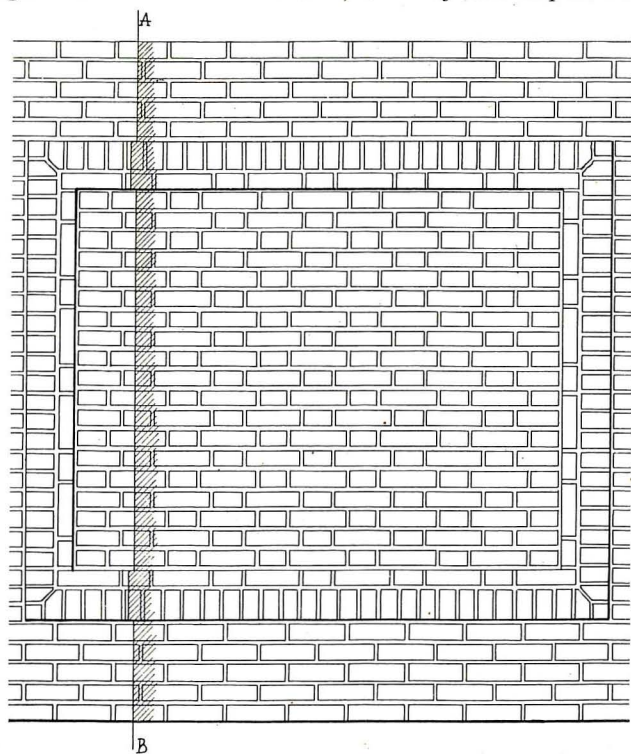


Fig. 1.

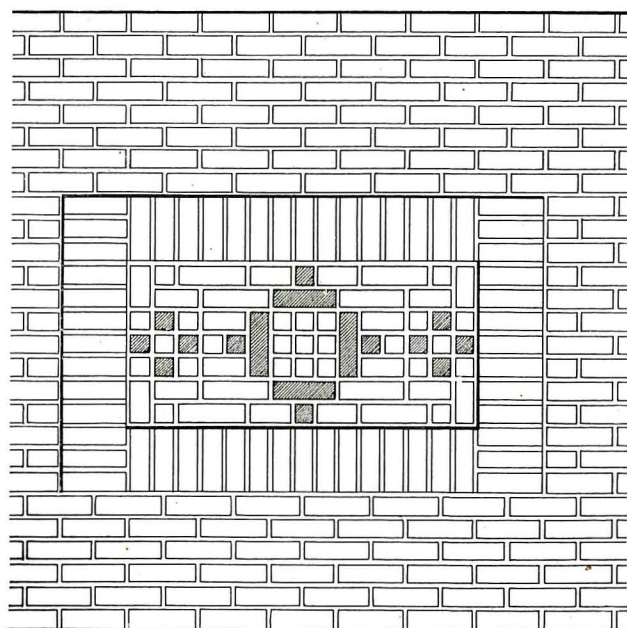


Fig. 2.



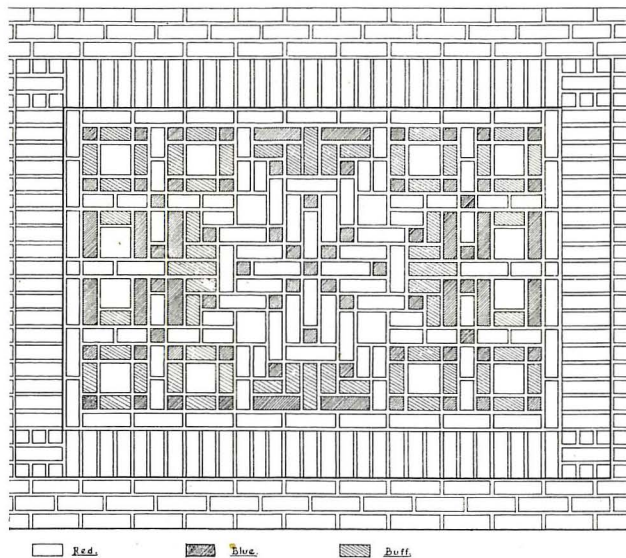


Fig. 3.

panel, in order that all specified vertical and horizontal joints shall be in straight lines.

Figure 3 is a problem similar in some ways to that of Fig. 2, yet decidedly more difficult to lay. The margins are similar, with the exception of the corners. In this problem, there are six small units inserted at the angles of the margins as shown in the cut. The careful arrangement of the various shades in the panel produces an effect very similar to a large oriental rug. This design is a replica of one of the interior wall panels, which adorns the Hotel Belvidere, at Baltimore, Md.

In Figure 4 we have a problem somewhat different from the preceding ones. By noting the shading and also the sectional views of the previous cuts, you will find that the panels and the general wall

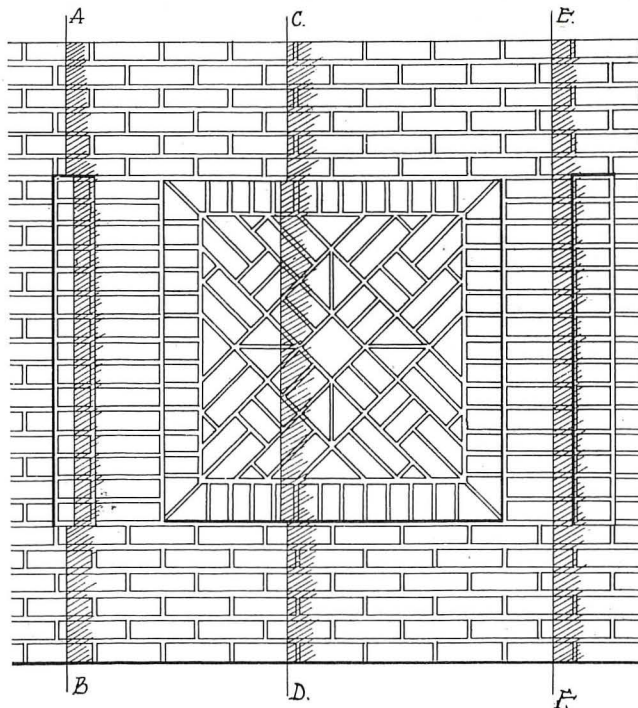


Fig. 4.

surfaces are in line with each other, and that the margins project therefrom. But in Fig. 4, the panel and its margin are flush with each other, and together they are raised or projected from the general trend of the wall. Again by careful scrutiny of Figure 4, you will notice that there are two vertical "chases" spaced one brick on each side of the panel, and extend the same height as the panel itself. The "chases" recede the same amount that the panel projects, approximately 1 inch.

The main object in the construction of a panel of this type is to carry the main joints in a straight line and at an exact angle of 45 degrees. Great skill and care should be exercised in the cutting and fitting of the various units.

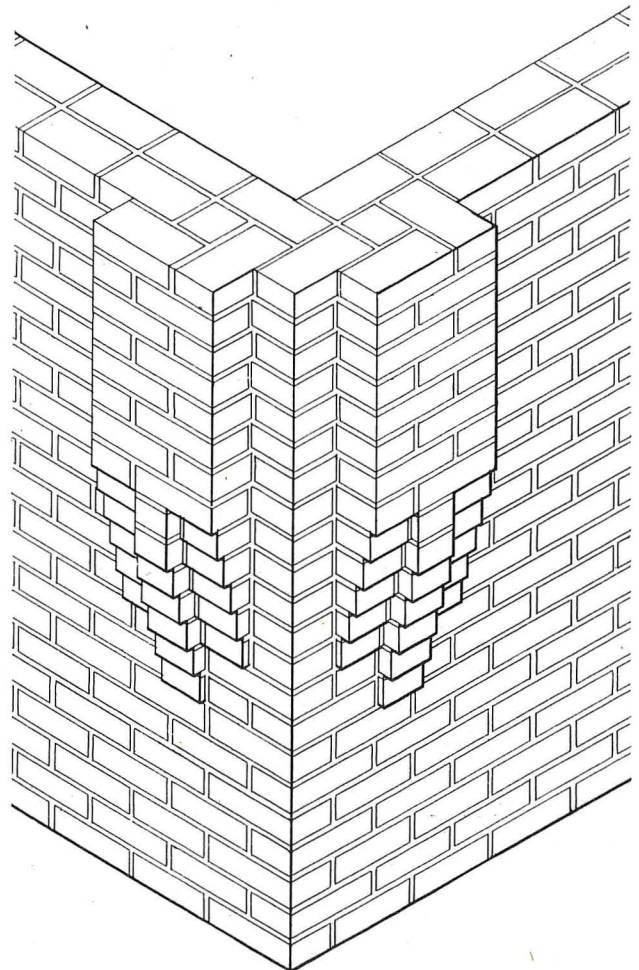


Fig. 5.

Pilasters are supports built in a wall and projecting slightly from it. They are used to give strength to a wall and to economize material. A wall with pilasters, when used for strength and spaced not too far apart, is almost as stiff as a wall of uniform thickness equal to that thru the pilasters. They are also used for architectural effects.

Figure 5 illustrates pilasters of the latter type. The construction of these pilasters consists of three brackets, corbelled three-fourths of an inch at a time, for six courses, with the central bracket starting from



two to four courses below the two lateral ones. (See cut.) When an overall projection of four and one-half inches is attained, the corbelling ceases and the work is carried plumb, care being taken to produce the proper bond for strength.

In Figure 6, we have a problem of a wall containing two ornamental pilasters (similar to those of Figure 5), one at each extremity of the wall. The intervening space is crowned with a dentiled cornice, projecting two inches in two courses. The cornice consists of a series of four inch brackets, corbelling one inch at a time. Alternating brackets start on the same course, and one series of brackets begin to corbel one course lower than the other.

Figure 7 represents another type of cornice construction much prevalent in connection with ornamental pilasters, or may be used without any reference to pilaster construction whatever. In this problem, the first projecting course is one of stretchers and extends three-fourths of an inch beyond the general wall surface. The second course is a dentiled "row-lock" with alternating dentils projecting the same as the previous course. This is followed by a stretching course laid flush with the extending dentils. The

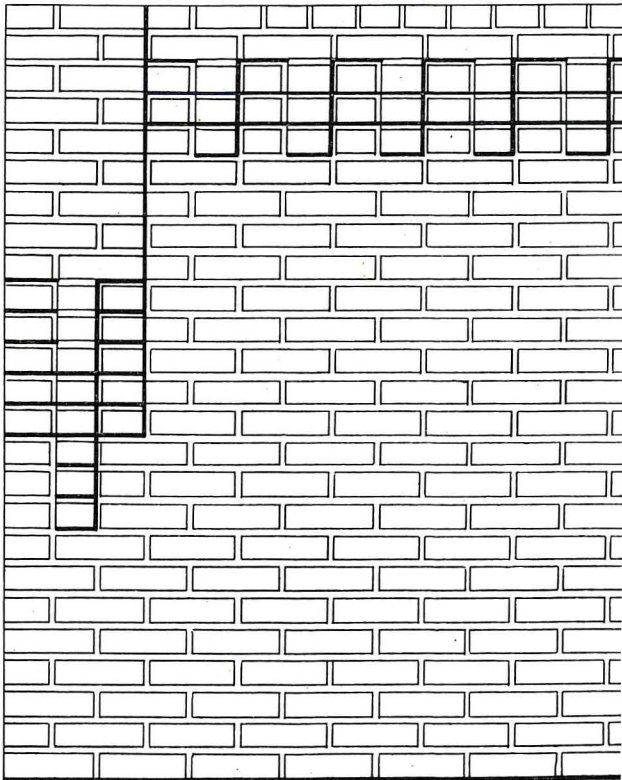


Fig. 6.

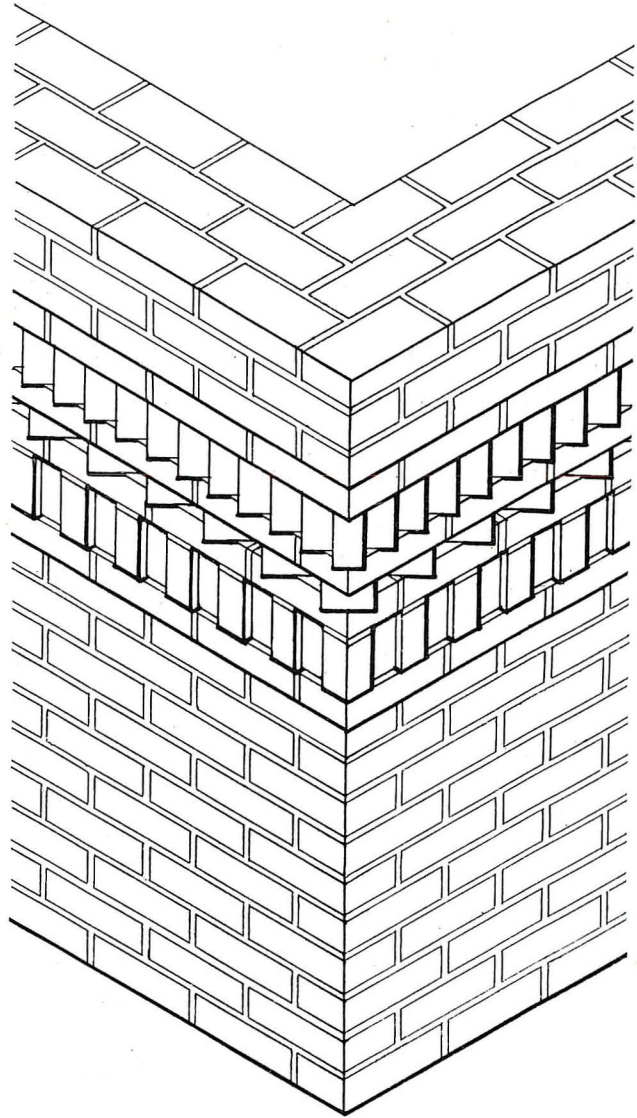


Fig. 7.

following course is known as a "saw-tooth" course and is laid at an angle of 45 degrees to the face of the wall (see cut), and it projects approximately one and one-quarter inches. The next succeeding course is one of stretchers laid flush with the extended "arrises" (edges) of the "saw-tooth" course. Next we have a second saw-tooth course, differing from the first, in that in this case the bricks are laid on edge, while in the foregoing one they are laid flat. The amount of projection of this course will approximate five-eighths of an inch. This course is crowned with another stretching course, flush with the extended arrises, the same as before. One more course of stretchers project and from two to four flush courses complete the cornice. If preferred the last course may be made a solid heading course.



# INDUSTRIAL-ARTS MAGAZINE

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## EDITORIAL

### TEACHING DESIGN.

THE attitude of the manual-training teacher toward design is improving. This is evident in the displays of work and in the demand for methods of instruction. However, the insistent demand for specific exercises in design on the part of the manual-training teacher is significant of more than his desire to teach design. It is significant of his helplessness and misunderstanding of the nature of design as a school subject.

The very term "design" signifies a latitude of thought and effort. It is evident that imitation of a good design is not design, tho it may be a method of helping toward appreciation. We cannot give credit for originality to the student of mathematics, who peeps into the back of the book for the answer before beginning the problem. We cannot give credit for good instruction in design to teachers of manual training who persistently copy models and produce the same objects year after year, however well the work may be executed. Every legitimate problem in design must be a problem of line and form to the purpose of producing a useful and beautiful object. No recipes will be found for this process. General principles and restrictions only can guide the designer. The teacher must point the way thru the guidance of these principles and restrictions, but he must not dictate specific designs and hope to develop originality on the part of his pupils.

### A SHORT-SIGHTED POLICY.

WITHIN the past few weeks the School Board in a western city employed a manual training supervisor with some years of experience to inspect the work of the Manual Training Department of the schools. After an investigation of the situation, a report was made to the Board in which the installation of a small printing plant was recommended. One of the printing establishments of the community immediately began a campaign in opposition to this move. In a letter, the president of the company stated: "Of course the local printers think this (the establishment of printing in the department) would be an unwise move, and will oppose it actively."

As we have often observed, employers take advantage of every opportunity to criticise the work

of the schools, but the minute that a move is made to make the school work more practical, they oppose it actively.

In this case the proprietor evidently fears that if the schools establish a printing department, the department may do some of the school's printing and he may thereby lose a few dollars in the year. He does not hesitate to place the value of a few dollars above the welfare of the boys and girls of the community. At the same time, the Association of which he is a member is exerting a great deal of energy to induce capable boys to enter the printing trade.

In the report of the Committee on apprentices of the United Typothetae of America (which is an organization of employing printers), the following statement is found: "Your committee believes that the fundamentals covering apprentice selection should consist of: First, an earnest desire to become a printer; second, good morals; third, at least a grammar school education." The only way by which a boy may know that he has an earnest desire to become a printer is thru some experience in printing, and it is the chief purpose of printing in a manual training department to give a boy this experience. This will save some employer the expense of hiring boys and later firing them when they find they have no such desire. Most boys who leave school early have to go to work at once and they have no time to experiment in a number of employments. Therefore if they are to secure a complete grammar school education they should have some opportunity while going to school to discover any aptitude that they may have for particular occupations.

The report of the printing trades of the Industrial Survey made by the Chamber of Commerce of Cincinnati states: "Printing in the public schools is highly desirable, as manual training work—but should always be considered manual training work strictly, and not in any sense the teaching of a trade. No other form of manual training can be introduced into the public schools that can be made to yield such large results in developing a clearer and better understanding of language and in giving definite value to drawing, as that of printing, provided in teaching it, emphasis is given to the literary instead of the mechanical side of the work. The introduction of printing as a manual training subject is recommended for the prevocational classes of the elementary schools and for the high schools."

It is hardly probable that any considerable number of employing printers will seriously oppose the introduction of printing in the schools, especially when such a move is destined to furnish them boys who know that they want to become printers, and to know type from slugs. It will give large numbers of boys the ability to judge of printing and to accept only good printing when ordering such work.



The duty of a school board in such a situation is clear. The board cannot listen for a minute to objections to any move, from persons whose only interest in the case is prompted by selfishness, and who entirely disregard the welfare of the boys and girls in the situation.

#### READY-MADE EDUCATION.

FROM ready-made designs and ready-made courses in Manual Arts, the American teacher is progressing toward the conviction that designs and courses cannot be made to fit all school needs. Just as the ready-made suit is fitted by cutting a little here, and letting out a little there, so ready-made Manual Arts courses have been fitted to schools by industrious jobbers of school courses.

To be sure the Jobber in ready-made courses has always emphasized the elasticity of his course. It is a good talking point. A salesman knows that the individual prides himself on nothing more than upon his individuality. This pride on the part of the Industrial Arts teacher will be the ultimate salvation of the Industrial Arts in our schools. When the pride of the individual has so possessed the Industrial Arts teacher that he studies his problems in the light of sound educational principles, and the needs of his community, then will the jobber in educational hand-me-downs go out of business.

#### ON SENTIMENT.

THE closing remark of a recent address by Frank Alvah Parsons is significant: "Divorce sentiment from the aesthetic sense of color and form harmony. If you do not respond to these you get no artistic idea."

We presume Mr. Parsons' remarks were directed against the puerile, false sentiment of a class of enthusiasts who enthuse with little reason. It is the function of art to create sentiment. The sentiment created by art is enjoyable. Enjoyment is often as much in anticipation as in experience, but the anticipation is created by a previous experience, or by the infectious enthusiasm of some other person.

It is *affected* sentiment that should be divorced from the aesthetic sense. Honest, joyous sentiment is a desirable human characteristic, and is contagious. Children are usually honest in their sentiments as they are also especially subject to contagious enthusiasm.

The American Schools have as much to fear from instruction that is only formal and analytical and which has no appeal to the sentiments, as they have from over-sentiment. A vital question before the teacher of the industrial arts is how to create a response from the pupil. To be sure art is logical to the mind that can analyze it, but we question if there will be a substantial advance made in the

appreciation of beauty by analysis unsupported by sentiment. We may analyze existing forms of design and find a rule for the creation of similar designs. We may establish principles of design based upon our findings and may emphasize these principles to our pupils. Indeed, it may be taken for granted that we should and must do these things, yet we have not satisfied our obligations as teachers by this formal process. It is idle to conceive that appreciation of beauty rests only with those who understand the analysis of color and form. If this were true, the appreciation of music and art would rest only with the person who understood their constructive form and arrangement.

The problem of Art instruction is not so simple as the committing of rules, and practice in conformity to them. The result of such instruction is as devoid of originality as it is of sentiment. Art appreciation results from a state of mind in which honest sentiment has an important part. As teachers we just enthuse and hope to inspire.

#### SPECIFYING EQUIPMENT.

At this time of the year, it is necessary to begin to plan for the purchasing of needed equipment and of renewing old or worn out benches, tools and machinery. In every case the director or teacher of manual training should be allowed to specify the make, quality and size of equipment that is purchased for his department. He is or should be an expert on these matters, and it will be economical to follow his suggestions. However, things in schools are not always as they should be and it sometimes happens that the purchasing agent of the School Board or some member does the purchasing. In such cases the chances are that the new equipment will not be suited to the needs of the manual training department.

Even in such cases the shrewd manual training teacher or supervisor will so arrange matters that he will specify the make and quality of his equipment. In making his requisitions, the teacher should specify the make, size, and quality of every article requested. If this is done the party that does the ordering will find the easiest method open to him is to send in the order as it is and the chances are that he will do so. He will also gradually come to realize that the manual training man knows his business and will in time defer to his judgment.

It will be well for us not to assume an attitude of condescension towards the crowd. Because in the matter of looking without seeing we are all about equal. We all go to and fro in a state of the observing faculties which somewhat resembles coma. We are all content to look and not see.—*Arnold Bennett.*



## PROBLEMS AND PROJECTS

THE Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, presents each month a wide variety of class and shop projects in the Industrial Arts.

Beginning with January 1, 1916, the Magazine will award a monthly prize of \$10 for a meritorious problem used in the Department. This is not a prize contest in the ordinary sense. Every problem accepted for publication will be paid for. The prize will be simply a reward of merit.

From the material submitted by readers, the Editors will select each month for the award one problem of especial merit, judged from such standpoints as originality, good construction, artistic merit, adaptability to school work, and quality of drawings and photographs submitted.

The brief description of constructed problems should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are eligible for consideration.

Drawings and manuscripts should be mailed flat and should be addressed:

The Editors, INDUSTRIAL-ARTS MAGAZINE,  
Milwaukee, Wis.

### BOOK TROUGH AND MAGAZINE CASE.

Linder S. Wood, Mt. Carmel, Ill.

The Book Trough and Magazine Case is a very convenient and useful article. The making of this piece is a good problem for the first-year high school student, since it gives practice in the fitting of shelves, and in making the mortise and tenon joint. If it is made of oak (fumed or golden), brass screws should be used in the places indicated. The shelves may be fastened at the corners with 2-inch brass screws, or better still, bore  $\frac{7}{16}$ -inch holes half thru the posts and use  $1\frac{1}{2}$ -inch bright screws. The holes may be filled with pins, which have heads about  $\frac{5}{8}$ -inch in diameter. The pin in the back corner of the lower shelf is needed for decoration only.

Stock list for Book Trough and Magazine Case:

- 2 posts  $1\frac{1}{2}$ "x $1\frac{1}{2}$ "x30"
- 2 posts  $1\frac{1}{2}$ "x $1\frac{1}{2}$ "x31"
- 2 end rails  $\frac{3}{4}$ "x3"x $11\frac{3}{4}$ "
- 2 end rails  $\frac{3}{4}$ "x2"x $11\frac{3}{4}$ "
- 2 end slats  $\frac{1}{2}$ "x $4\frac{1}{4}$ "x20"

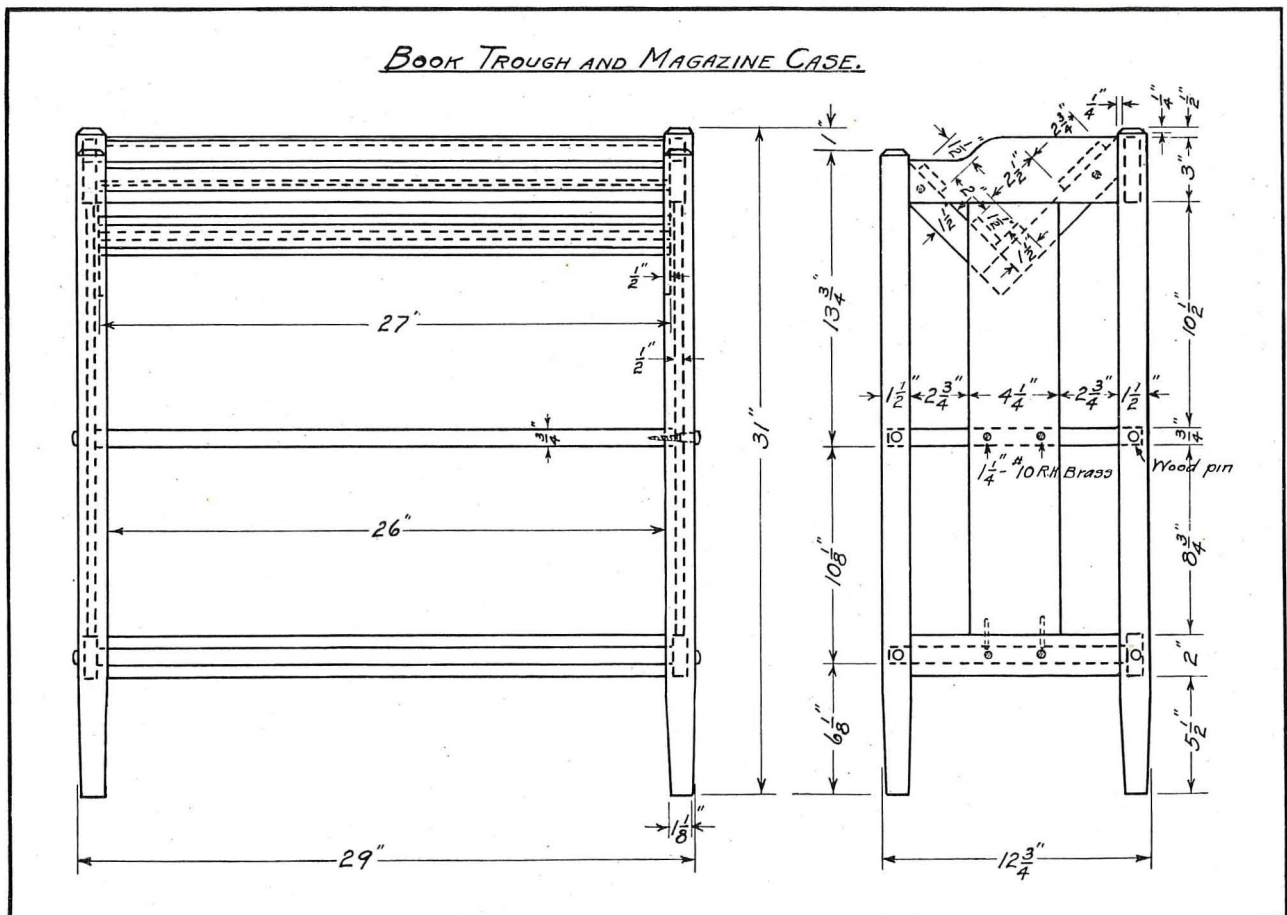
- 1 shelf  $\frac{3}{4}$ "x12"x27 $\frac{3}{8}$ "
- 1 shelf  $\frac{3}{4}$ "x11 $\frac{3}{8}$ "x27 $\frac{1}{8}$ "
- Trough—2 supports  $\frac{1}{2}$ "x $1\frac{1}{2}$ "x9"
- 2 supports  $\frac{1}{2}$ "x $1\frac{1}{2}$ "x7 $\frac{1}{2}$ "
- 3 slats  $\frac{1}{2}$ "x $1\frac{1}{2}$ "x27"
- 1 slat  $\frac{1}{2}$ "x2 $\frac{3}{4}$ "x27"

### A SAMPLER'S PICK.

Lee M. Klinefelter, Hesperus, Colo.

In search of a not too complicated project for tool smithing, the Sampler's Pick was designed. For boys in a mining district this pick has a decided interest, and in other places it may be used as a geologist's hammer or pick.

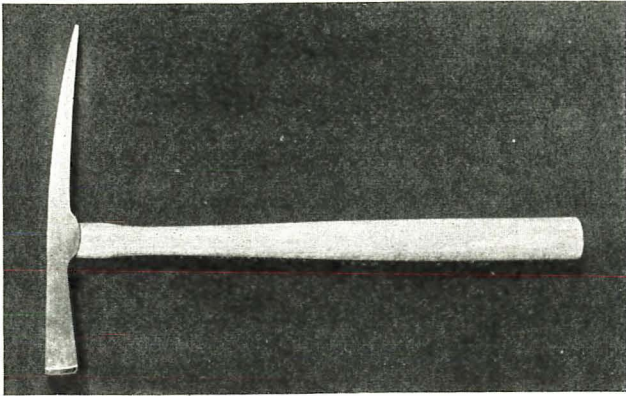
The pick is made of tool steel, about 75-point carbon, and the stock should be an inch square, by 5 $\frac{1}{2}$  inches long. The eye should be first punched, its center being 3 inches from the head end of stock. The stock is then fullered in on both sides of the eye, with half-inch fullers. The head should be shaped and the stock thinned down to about  $\frac{7}{8}$  inch at the eye. A drift pin or punch should be kept in the eye during this operation to prevent its being knocked out of





shape. The pick point should now be drawn out of the short end of the steel, and the forging completed.

The tool should be ground all over on a coarse wheel, and then annealed. The annealing not only improves the grain of the steel, but leaves the tool in much better shape for filing, after grinding. Now file up, draw-filing where



Sampler's Pick.

possible, and smooth up the eye, allowing it to taper toward the center from both sides. After filing, the tool is polished with emery and oil, and is ready for hardening.

The pick may be hardened and tempered in one operation or it may be hardened, repolished, and the temper drawn with hot irons. In either case the face of the head, and the pick point should be drawn to a light blue or purple. The temper colors may be left on or polished off, as desired.

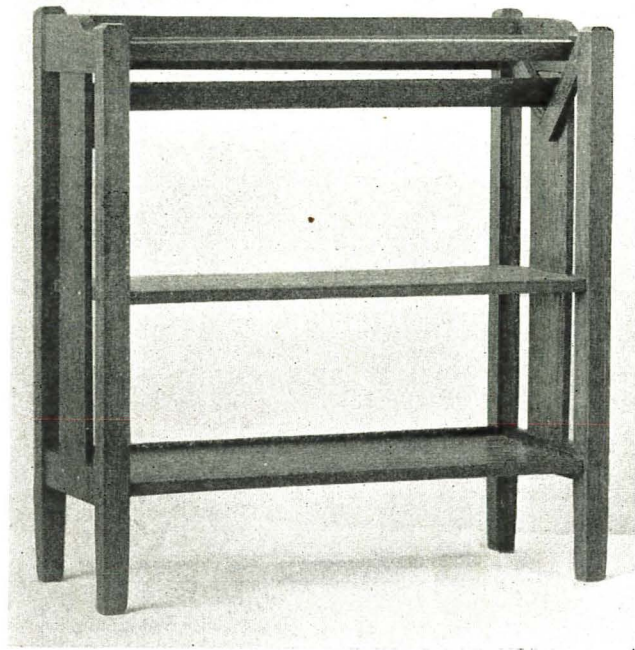
#### DEVELOPING INVENTIVE ABILITY IN THE BOY.

Hans J. Nordman, Astoria (Queens), New York City.

No greater incentive for developing inventive ability in terms of constructive thinking can be resorted to than that of appeal to the play instinct of the boy. This was evidenced in the planning of the Airmobile which was designed solely from the ideas and suggestions furnished by a group of 25 boys.

Skatemobiling had become a very popular sport among the boys of Astoria. An old soap box with a piece board four inches wide, on to which were screwed four skate wheels, was the conventional skatemobile made by the boys at home.

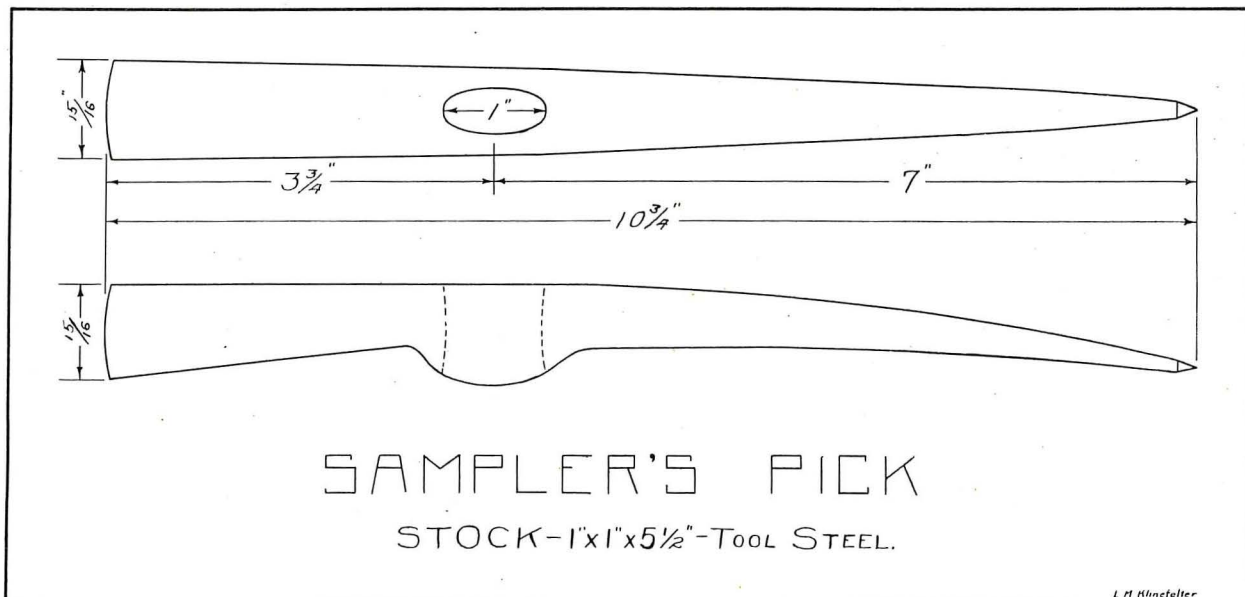
Observing the great interest the boys had in this sport, it occurred to me that the building of skatemobiles in the



Book Trough. (See page 268.)

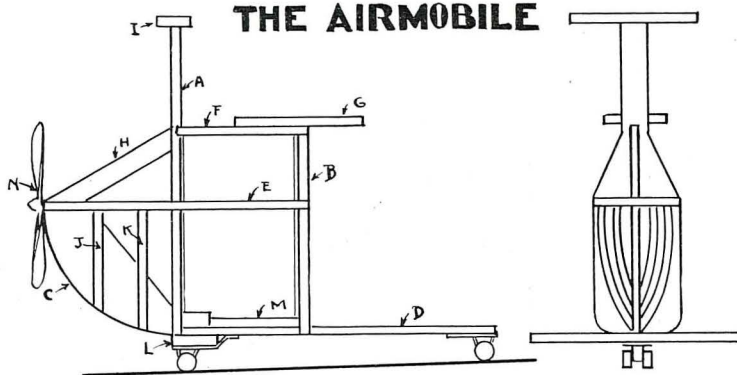
school workshop would be an appropriate project. The boys were asked to bring in several of their home made models for the purpose of determining dimensions. When they learned that they were going to build skatemobiles in the shop, a spirit of joy and enthusiasm was aroused that stirred the whole school to action. Principal and teachers because of the happy and joyful atmosphere reflected by the pupils sensed that something was in the air.

I called a conference and discussed with the boys the making of a modified skatemobile. Blackboard sketches were made as suggestions were offered. Since speed was the most important factor the boys were concerned with, it was necessary to have the skatemobile properly stream-lined in order to reduce head resistance. Various shapes were drawn showing how the air acts on members having a sharp entering edge and those having a blunt entering edge. As each suggested feature was threshed out we listed it, so as not to forget to incorporate it in the new model. The boys wanted to sit on it and a seat had to be provided. It was

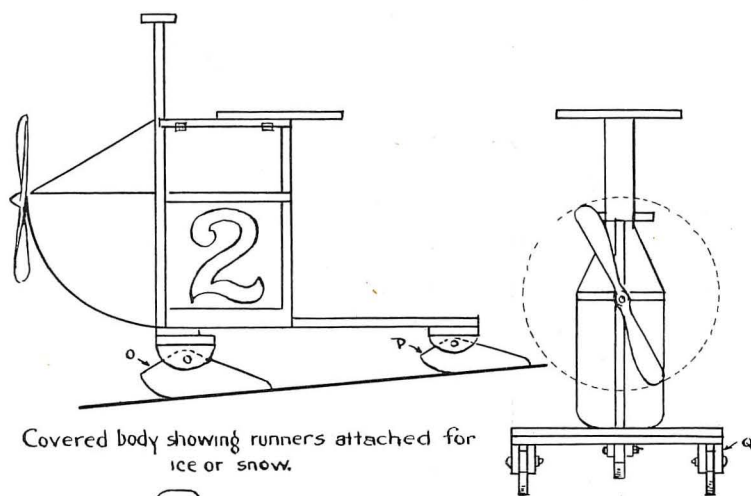




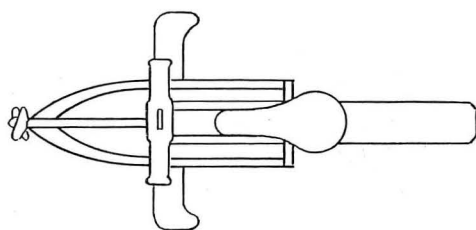
# THE AIRMOBILE



Skeleton view showing skates attached for use on asphalt pavements.



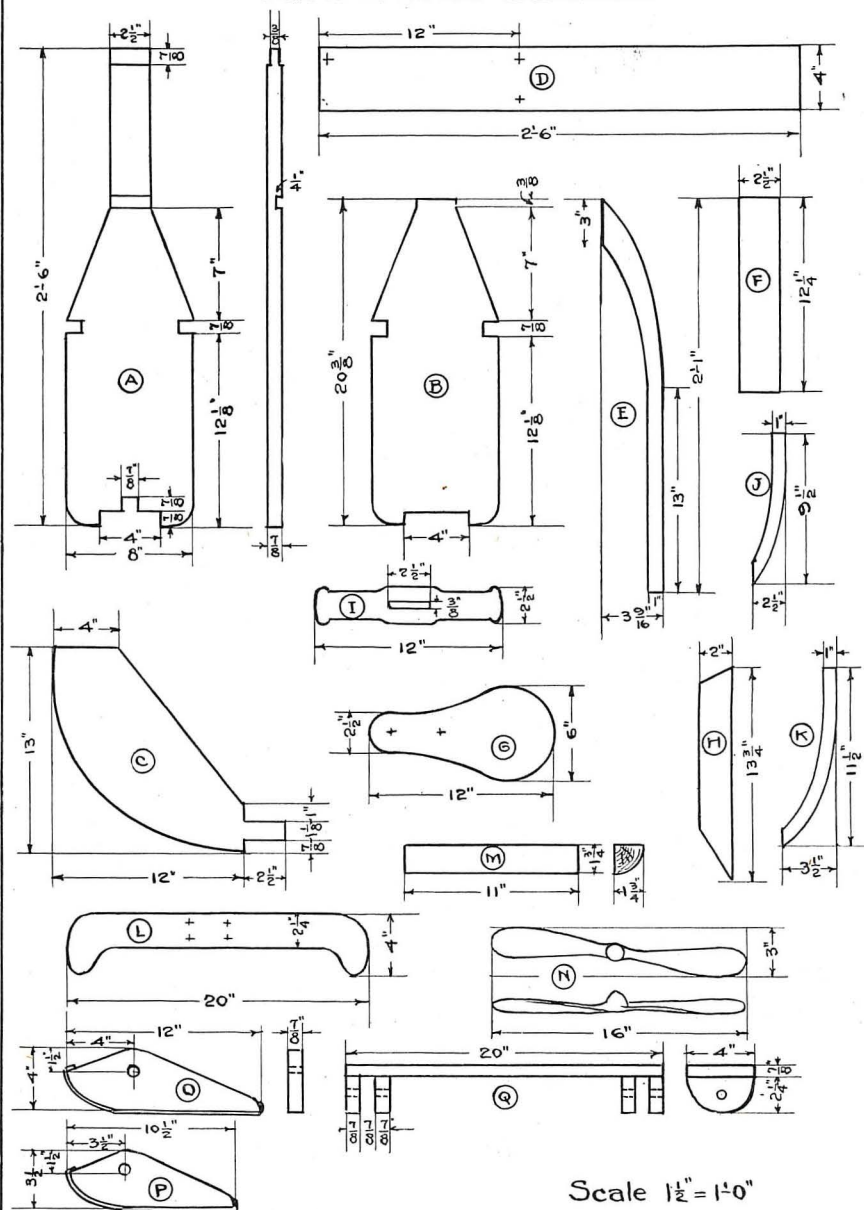
Covered body showing runners attached for ice or snow.



Plan View

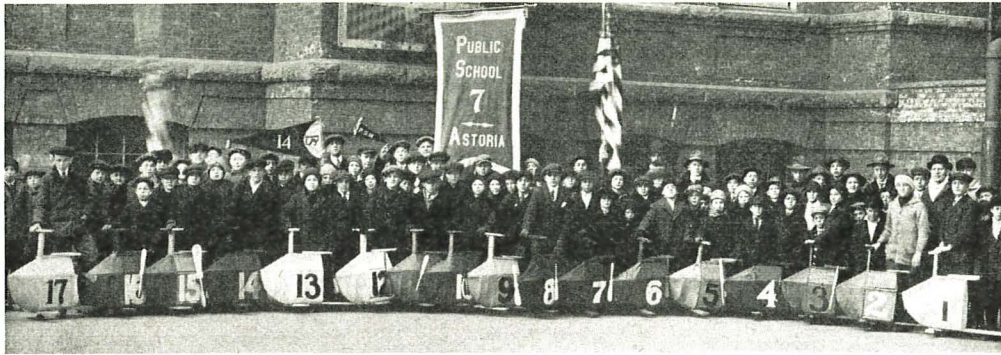
Scale 1" = 1'-0"

## AIRMOBILE DETAILS



Scale 1 1/2" = 1'-0"





Airmobiles lined up before Parade.

necessary to have a support for the feet and we determined on a foot rest. It was suggested to have a propeller on the front which would whirl around when the skatemobile was in motion. Thus the name AIRMOBILE was evolved. Several boys thought it a good plan to have a box in which they could put some tools, an oil can, etc., or, as often happens when they have to go to the store for their mothers, to carry their parcel. Instead of a box we made a compartment in the side with a little hinged door as a part of the body. The propeller had to clear the knees, making it necessary to place it about a foot from the front. With the propeller placed at its proper distance we simply drew a curved line from the propeller hub to the bottom, which gave the Airmobile its boat appearance. To avoid having it look stumpy another line was drawn from the propeller hub to the seat line. This part we decided to cover with canvas.

After all the blackboard sketching was finished, I had a model that every boy had taken part in designing. The airmobile was carefully drawn out and full-size cardboard templates made of each part. The wood was furnished by the boys. Most of them were not able to buy new lumber, so old boxes, shelves, barn boards and old bedsteads were brought into the shop.

Of course this was not all regular classwork. Only the boys who were members of the Arts and Crafts Club were allowed to build the Airmobiles, and this work was carried on after school. In building them some boys worked faster than others. Those who finished first had to help the backward ones.

Before all 25 were finished we arranged to have a race. The fact that we were going to hold the race made the work all the more fascinating. It was driven home rather forcibly that the best constructed Airmobile would undoubtedly win the race. I did not have to dwell on good workmanship and the different forms of construction as much as in a regular class lesson. The different processes were presented as occasion arose. Mortises, tenons, dados, lap joints and butt joints meant more to those boys thru having used them in the construction of the Airmobile, than if they were given in lesson form.

The painting was left to the boys' own discretion. Each airmobile was painted one color.

The height of enthusiasm was reached on the day of the race. A parade was arranged terminating at the race course. An automobile, a fife and drum corps and a troop of boy scouts were in the procession. The boys with their airmobiles were strung out for nearly four blocks. The races, which were run off in heats, attracted many people.

The evolution of the airmobile proved a stimulus for the further development of inventive ability. Little search-lights, electric bells, different wheels and many other new features were applied. The local librarian reported that the supply of books on inventions was nearly exhausted, as the boys were in every day taking them out.

#### THE SCREW-JACK.

John H. Faust, School of Industrial Arts, Mt. Vernon, N. Y.

The Screw Jack is one of many problems that incites enthusiasm in the boy and helps him in the selection of tools which can best do the work. He is confronted with a

problem from the very beginning by having to use stock for the screw which is already of the right diameter and it is up to him to cut to length and center properly, which is accomplished by chucking one end and using steady rest to keep it guided while centering; he then reverses and does likewise on the other end. He puts his work between centers and starts roughing out with a diamond-pointed tool, after which he rolls the knurl on head end (this he does before finishing cuts are taken, to avoid work running out of true, due to strain on centers). He is now ready to proceed with the finishing cut and starts at the end which is the body of the screw. This is measured with a micrometer to insure a good size. The shoulders are faced off to proper lengths, after which the end, which receives the top piece, is finished to proper diameter and length.

Before cutting the thread, he is called upon to figure his

thread depth and this he gets by the formula:  $\frac{p}{2} + .005''$

The .005'' is added for clearance at root of thread.

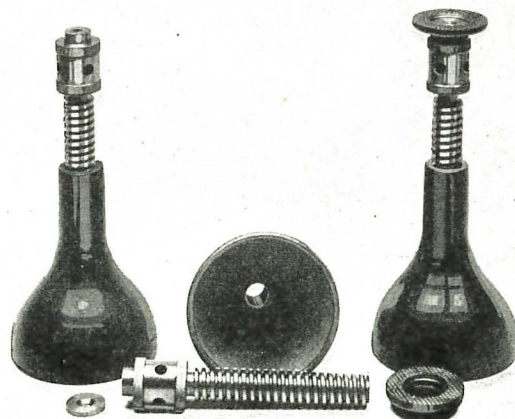
$\frac{p}{2}$  gives him the thickness of tooth, which is necessary for

him to know in order to grind his tool for width of space. He then notices that his drawing calls for 4 threads per inch;

therefore pitch =  $\frac{1}{4} = .25''$ . The depth

of cut =  $p/2 + .005 = \frac{1}{4} \times \frac{1}{2} + .005'' = .130''$  Width of thread and space =  $p/2 = \frac{1}{4} \times \frac{1}{2} = .125''$  He now gets two tools ground up, one being about 1-32'' small, which is used for roughing and the other  $\frac{1}{8}''$  or .125'' in width, for finishing thread to required thickness.

After arranging his gears properly he puts back his chuck and tightens up work on short extension for top piece, being careful that it is running true. The other end is supported



Screw Jacks.







# ITEMS OF CURRENT INTEREST

## BEER KEGS—PRESTO—FURNITURE.

Corinne McGhie, Senior in Cherokee County High School, Columbus, Kans.

In the County High School, of Cherokee County, Kansas, the Industrial Department has for the past seven years made good use of confiscated beer kegs. Cherokee County is on the border line of the State of Missouri and, since Kansas passed the prohibition law, liquor has frequently drifted across the line, some to be captured by the sheriff. The state law provides for the destruction of contraband containers. The Industrial Department of the County High School was of the opinion that destruction did not necessarily mean destroying by fire. Accordingly a petition was presented to the Court, and permission was given for the High School to receive gratis, all bar fixtures and kegs on condition that they be immediately converted into articles for home use.

The present article is intended to give a few of the uses to which these things have been put and to show any other school interested, the financial benefits to be derived from them. The practical value of the idea will be especially suggestive to schools in the states which have just "gone dry."

Illustration No. 1 shows a collection of kegs given to the high school. The kegs are in good condition. The wood is usually quarter-sawed white oak of the best quality. The beautiful grain of the wood may be worked up to show off, to advantage, its superiority over the plain oak. In the past seven years, the school has used more than one thousand kegs, saving at a minimum, \$500, and giving much better material than could otherwise be afforded.

Two sizes of kegs are used, the eight gallon and the sixteen gallon. The smaller kegs, of course, do not afford as large pieces but many of small articles can be made from them. The department teaches the boys how to fit together and how to work the pieces into smooth, flat, polished surfaces.

Every part of the keg, including the hoops, is used. Many articles including pedestals, rocking chairs and dining chair backs, rockers and foot-stool rails, are made from the staves, which have a natural curvature. In the last four years, the department has used none but the contraband material for the backs of the chairs.

For other articles, the staves are boiled about one hour in a tank of water. This puts them into such condition that they can be pressed to any desired shape. When straightened a piece of oak about two feet long and from two to five inches in width results.

In the turning department a variety of articles is made, ranging from powder puff boxes and card trays to church collection plates. Additional articles such as pin trays,

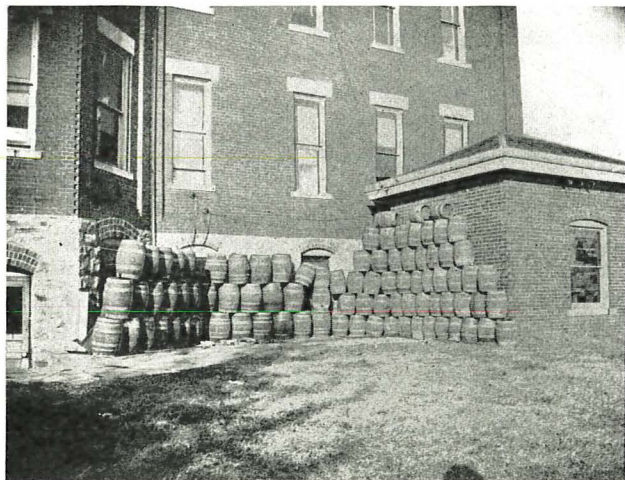
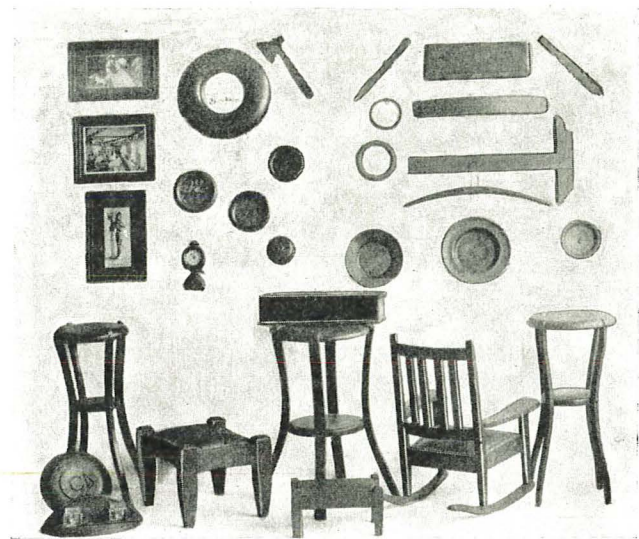


Illustration No. 1. Beer Kegs Stacked Outside Cherokee County High School.



Articles made from Beer Kegs.

picture frames, nut bowls and paper knives may also be made. The department has considered the advisability of making small articles to be placed on the market, giving the proceeds for the erection of a building to replace the recently burned school structure. Most of the turned articles are made from the heads of the kegs. The collection plate made from this wood is especially pleasing.

The bar fixtures are utilized in making larger pieces of furniture. The large counters offer valuable material for the construction of library tables, piano benches, book-cases and writing desks.

The practical character of the work has attracted considerable attention among the schools in Kansas. Each year the South Eastern Kansas Teachers' Association includes as one of its chief features, an exhibit of the work of the students in the Cherokee County High Schools.

## NORTH TEXAS MANUAL ARTS TEACHERS ORGANIZE.

The initial meeting of the North Texas Manual Arts Teachers' Association was held on March 25th at Dallas, Tex. Thirty teachers from the North Texas district attended.

The sessions opened with an address by Supt. J. F. Kimball of Dallas, who welcomed the visiting teachers. Mr. O. A. Hanszen gave an address on "The Development of Manual Arts in the Public Schools of Texas;" Mr. A. B. Sage and Mr. A. A. Scott on "To What Extent Should the Manual Arts Department Execute Useful Work for the School System;" Mr. Sydney Swain and Mr. F. L. Scott on "A Uniform Standard and Method of Grading Students' Work"; Mr. L. V. Stockford on "State Aid for Manual Training"; Mr. P. E. Harris and Mr. C. M. Haines on "The Problem of Adapting Manual Arts to the Need of Vocational Education for the Industries"; Miss M. Marshall on "Decorative Design in the Manual Arts;" Mr. S. A. Blackburn and Mr. O. A. Hanszen on "The Value of a Notebook or Laboratory Manual in Teaching Manual Arts."

The following officers were elected: President, Mr. C. M. Haines, Fort Worth; secretary-treasurer, Mr. A. B. Sage, Dallas.

The State College of Washington located at Pullman will offer a special course in its summer session for teachers of Manual Training and Industrial Education. The courses will be taught by Prof. Wilson H. Henderson of the University of Wisconsin. The manual training teachers of the state are being urged to take advantage of the opportunity to attend these courses.



# The Eastern Arts Association Convention

The biggest convention in the history of the Association was held in Springfield, Mass., April 20, 21 and 22. More than 1,300 teachers fed themselves from the tables of learning. There were quick lunches, a la carte meals and table d' hôte dinners with blessed moments of rest for breath and digestive functioning between. These breathing spells were so beneficial that many remarked about them and hereafter the program committees will pay special attention to this really necessary feature of a profitable convention.

With such a quietly aggressive president as Millard B. King, State House, Harrisburg, Pa., the wheels turned without apparent friction. With but one exception all speakers were present at the general sessions and in that case the speaker provided for the reading of his paper. At the round table or section meetings the same high percentage prevailed. All sessions were unusually well attended. There was, perhaps, a predominance of papers on the decorative arts and a scarcity of material on the other arts at the general sessions. And yet the industrial aspect of the decorative arts was ever apparent.

There were still audible murmurings over the change in name and some quiet discussion, but the matter failed to come up at the business session and for another year the efficient and uncomplaining secretary, Fred P. Reagle of Montclair, N. J., will be permitted to use three instead of seven words in signing his numerous letters and checks.

In general the big idea which seemed to prevail thruout all sessions was that the various arts, industrial, vocational, manual, household and fine, should have a sanely practical bent. Problems should not be given solely for the tool processes to be learned. Projects should be presented because of a real need, made apparent because of a pupil's future or his individual capacity or his decided interest, or perhaps because of urgent necessity for school or home repair. The old course of study was forgotten in the eager demand for real doing with a sound reason back of it. Of course, this is what the progressive teacher has been doing for some time but more and greater stress was laid upon this aspect of the work than ever before.

Doctor David Snedden, Commissioner of Education for Massachusetts, sounded the key note at his banquet speech when he said that we must not only have clearer definitions for our terminology in the arts, but more important than that, we must discover and analyze their real functioning.

The three days of good things were divided into general sessions, round tables, section luncheons, the banquet and the evening of exhibits. In addition there were the usual excursions. The section lunches were provided so that different groups might discuss the morning papers during their noon hour. This proved to be a most valuable addition to the usual convention program.

The morning or general sessions were, as may be supposed, more or less broad in treatment. "Problems in Interior Decoration" by Vesper L. George of the Massachusetts Normal Art School was of unusual interest because of the large drawings which he made. His plea was for good art in furnishings regardless of Period styles. He said that it is not essential to display Period chairs to be in good taste, but that a chair or room is in good taste if it is well designed.

It was a disappointment that Doctor Frederick A. Bonser of Columbia could not be present, but his paper, "Industrial Education in Present School Problems," was well appreciated. In a sentence he said that the problem of industrial education has three phases, that of studying industry so that the intelligent and useful selection of industrial commodities will result, that of studying industry and industrial conditions so that proper attitude toward the dignity and safeguards of industry will be developed in the mass of citizens, and also that study of industrial training which will produce skilled workmen. Following this he detailed more fully his ideas concerning industrial arts education.

A most practical talk was given by Mr. Arthur Allen

of Phillip Ruxton Company, Inc., New York City. He discussed the problem of bridging the gap between the modern art school and the business world in which the graphic arts play such an important part. Numerous examples of good and bad printing were displayed and the audience was impressed by his many statements to the effect that the graphic arts field is still in its infancy and the good artist may readily find a place.

Miss Sarah Louise Arnold, Dean of Simmons College, following the general trend emphasized the necessity of teaching household arts practically. The tendency today is to begin at the top of the educational system and work backward to rudiments, believing that the girls can grasp the meaning of the art before they realize the details of the fundamentals. Cooking and similar domestic sciences should be taught gradually until the whole field of the art becomes clear to the student. Furthermore, the domestic arts should be fitted to the means and station in life of the students. Homely dishes are more necessary than the fantastic creations sometimes taught, and this ought to enter into the consideration of the teachers.

Mr. Arthur Wesley Dow of Columbia displayed work of his students and emphasized the need and opportunity for more color printing as art problems in the schools. Linoleum and a clothes wringer, as a last resort, may be employed to good advantage.

Round Table Meetings were organized for Technical, Mechanical Arts and Industrial Art High School teachers, Manual Training teachers, Household Arts teachers, Art teachers, Vocational School teachers and Industrial Training teachers for special classes. Papers were given on such topics as Vocational Guidance, Industrial Training in High Schools, Successful Experiments in Manual Training, Rural Problems of Household Arts Education, Yeast and its Scientific Consumption, Vocational Education in Massachusetts, the Ettinger Plan, Compulsory Continuation Schools, Methods in Teaching Design, Art in Illustrative Drawing, Industrial Training for Mentally Deficient Girls and for Mentally Deficient Boys, and Economic Aspects of Special Class Work, by such people as Meyer Bloomfield, Frank Mathewson, Ernest B. Kent, Marie Sayles, Doctor R. E. Lee of the Fleischman Company, Owen D. Evans, Robert O. Small, William E. Grady, Lucia W. Dement, Raymond P. Ensign, Franklin H. Perkins, Edith E. Woodhill, and Annis M. Sturgis.

As usual, the banquet proved to be a most enjoyable affair. More than one hundred were refused admission to the tables because of lack of room, but these and many others crowded in for the speaking.

The toastmaster, Mr. Stewart Anderson of the Massachusetts Mutual Life Insurance Company, was equal to his task and with a dignified humor presented the speakers: Henry T. Bailey, David Snedden and Alfred V. Churchill. Mr. Bailey spoke on "By-Products" and told how school papers and illustrative material may be saved and made usable for all time by mounting and filing similar to the School Arts "Alphabeticon." He made, as some one said, "a big address out of a little thing." Doctor Snedden's speech has been referred to. It was sound, progressive and inspiring for those who were broad enough to discern its advanced thinking.

The evening ended with an admirable interpretation of the efforts of the modern painters, the Futurists, the Cubists and the Synchronists, by Mr. Churchill. In spite of discourteous laughter, not at the speaker, but at the excellent views of the modernists' works, Mr. Churchill succeeded in presenting his message in an entertaining and sympathetic manner. With a few exceptions the audience was quite unsympathetic, a condition difficult to understand. Without doubt the leaders in the new movement are honest, sincere and truthful and in the mind of the writer, that day will eventually arrive when the world will acknowledge its indebtedness to these scorned pioneers for a new and lasting contribution to art.



The second meeting of the college and normal school section established only a year ago by Miss Mabel Soper of Bridgewater Normal School, Mass., proved the value of such an organization. The conference and luncheon were combined in one noon session. Its success was unquestioned. Over two hundred were present and dozens were turned away. At this meeting Doctor Snedden completed the address he gave the evening before and on this occasion he applied his thoughts more exclusively to the art field. The crux of his talk was this: that the modern tendency in art education is away from drawing and representation as the objective and toward the training of all in appreciation. And furthermore that appreciation is to be gained in some measure by drawing, designing and construction in order to establish intelligent understanding of beauty, but much more by the handling of real objects of beauty, for purposes of choosing and estimating between good and not so good, between the well designed and the poorly designed, etc.

Friday evening was devoted to exhibits which were held in the auditorium of one building of the Springfield Municipal group. The city was most generous in allowing the use of this building with its magnificent mahogany room for the entire three days. But unfortunately an auditorium is not the best place for a big exhibition and the room was somewhat crowded and poorly lighted. The problem of exhibiting to the best advantage for all concerned is still in an experimental stage. Mr. E. E. MacNary, of Springfield, and his able assistants did all that was humanly possible and deserve great credit.

There were fewer commercial exhibits than usual, due, possibly, to the increased expense connected with this meeting, but those shown were beautifully installed. The school exhibits were in most cases indicative of the newer developments in applied work. Real things of real value displaced the model, the exercise and the coat hanger. Objects which can not be found in the five and ten cent stores were in predominance.

Among art schools, the Cleveland School of Art and the Philadelphia School of Industrial Art showed exceptionally strong work. Among the cities, Yonkers, East Orange and Montclair may be noted among others equally good. In fact, so many places are specializing along definite lines that it may be unfair to others to even mention these.

Without doubt, however, the cream of school exhibits was from Springfield. This was partly due to the fact that the whole basement floor was devoted to the city work. It was also due to the effective work of the two directors, Mr. Newell and Mr. MacNary. This exhibit not only displayed work from each grade and school but showed a real unity of effort and result from the beginning. Evidences of successful correlation between art, manual training and vocational work were everywhere apparent.

But one thing remains which demands notice. Reports of various committees at the business session revealed the

fact that this association is accomplishing work of the utmost importance to teachers of the arts. Committees on Professional Status of Teachers, Time Allowance in Manual Training, Standards in Drawing and on Terminology presented reports showing not only hard work and marked progress but also a new and important opportunity in unity of effort among members of such an organization. The future will show unusual development along this line of endeavor to offer real contributions to the field of the various school arts.

Following the usual custom the next meeting of the Eastern Arts Association will be held nearer the Middle West, tho the place is yet undecided.

The following officers for 1916-1917 were elected:

President, Royal B. Farnum, State Specialist in Art Education, Albany, N. Y.

Vice-President, Egbert E. MacNary, Director Industrial Education, Springfield, Mass.

Secretary, Fred P. Reagle, Board of Education, Montclair, N. J.

Treasurer, Morris Greenberg, Commercial High School, Brooklyn, N. Y.

Members of the Council for three years, Herbert K. Kniffin, University of Pittsburgh, Pittsburgh, Pa.; Isabelle Lord, Pratt Institute, Brooklyn, N. Y.

*Royal B. Farnum.*

#### TEACHERS' WORK DURING THE WAR TIME.

John Y. Dunlop, Craighead, Tollcross, Glasgow, Scotland.

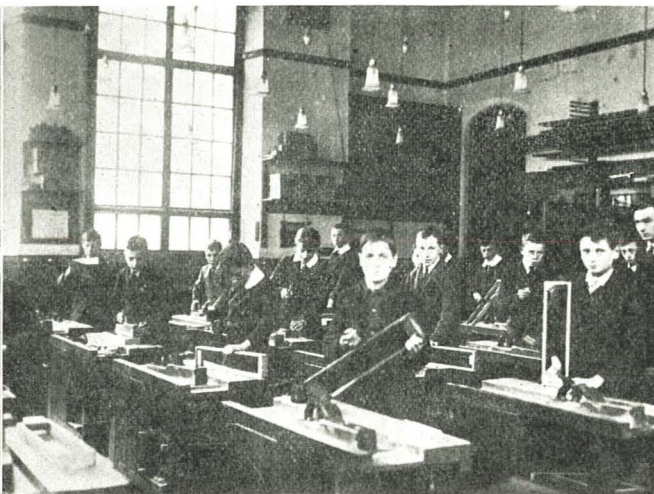
For those who have education, and those who are striving to raise the teaching profession in Britain to its proper place, the present outlook bristles with difficulties. The people in this country have never realized the true value of education, and in the time of retrenchment which must follow the war, when every penny spent must be scrutinized to see that a penny worth of value is gotten for it, it is greatly to be feared that the provision for education will be one of the first sources of saving to appeal to the so-called economist.

The teachers are the most important factor in education, and under the present circumstances, they are doing good work. Many of the staffs have been seriously depleted of male members and the extra work has been thrown on those left behind.

Many schools, too, have done much for the Red Cross work by knitting and making comforts for the inmates of hospitals. Others have, under the guidance of their teachers, held all kinds of entertainments whereby thousands of pounds have been raised for this laudable object. Boy scouts and girl guides have been enrolled from the senior pupils who have been put at the disposal of the military and hospital authorities in all the large centers. All this has not been done by the order of any official—indeed such orders would probably defeat their own end, and render formal and prosaic what is now spiritual and romantic.



Soldiers Being Taught War Cookery.



School Boys Making Periscopes in a Woodworking Class.



In all centers, the woodworking classes are mostly engaged on military or hospital equipments, and teachers vie with each other in having their class preparing such things as periscopes, bed tables, stools and other small supplies which are all so needful while this country is fighting.

Since the outbreak of the present war domestic science teachers have all been devoting much time to war cookery and to the training of soldiers in the necessary points in the cooking of a wholesome meal.

All this work has been taken up unhesitatingly by the teachers for the reason that however much knowledge we may impart of the history and greatness of our land we have failed in our true object if we have not produced a spirit of reverence for the right, a love of duty and a determination to help and defend our own country. In this way over 18,000 teachers sent in their names to the war service committees volunteering for any such work as was urgently requiring to be done.

## THE GRAND RAPIDS CONVENTION

Meeting of Western Drawing and Manual Training Association

A number of unusual features combined to make the Grand Rapids meeting of the Western Drawing and Manual Training Association one of the most successful that this organization has held in the twenty-three years of its existence. The attendance was the largest and the exhibits the most extensive that the Association has ever had. The headquarters were adequate and attractive and within a block of the place of meeting and the exhibits. The housing of the exhibits was exceptionally satisfactory, all being on one floor of the Klingman Exposition Building.

While the attendance was the largest, at the same time, many who usually attend the meetings were not present. By states, the attendance was as follows: Colorado, 1; Illinois, 57; Indiana, 37; Iowa, 12; Kansas, 2; Michigan outside of Grand Rapids, 163; Grand Rapids, 363; Minnesota, 11; Missouri, 5; Nebraska, 2; New Jersey, 1; New York, 4; North Dakota, 1; Ohio, 30; Pennsylvania, 2; Oregon, 1; South Dakota, 1; Tennessee, 1; Wisconsin, 27.

During the convention a daily bulletin listing all persons in attendance was published.

The manual training teachers were afforded opportunities to visit the largest and finest furniture factories in the world, the factories throwing their plants open to the visitors. Both the Oliver Machinery Company and the Grand Rapids School Equipment Company (formerly the Grand Rapids Hand Screw Co.) kept open house during the week. Automobiles were kept running from these plants to the headquarters and visitors were served lunch at the factory of the latter firm.

Drawing teachers, who were not interested in visiting factories and school equipment, spent their time when not attending the meetings inspecting the extensive school exhibits, attending reunions of their schools and in visiting art collections in the city. Household arts teachers had the opportunity of seeing the most improved kitchen appliances, and were given a reception by the local teachers in the Masonic Temple, which is furnished in an ideal manner with the best and most artistic furniture that is made in the city.

These activities were all in addition to a program unusually strong in all of the lines of work represented in the Association.

The program included such a wide variety of subjects and so many excellent features that it is impossible to mention them all. Every session was crowded full to overflowing with addresses and discussions of a very high order. The speakers were among the best that the country has in Vocational Education, Art, Household Arts, and Manual Training. Designers from the furniture factories explained how their product is planned and the elements considered in the designing. Expert costume designers explained their methods. The greatest sculptor in the country if not in the entire world inspired members with his optimism and his counsel. The leader in vocational education in this country gave his ideas of how this organization may take a foremost part in the development of taste in the product of our industries. The Art Supervisor in the high schools of New York gave practical demonstrations of the methods of giving children an appreciation of the work of the great artists of the world. The entire program gave evidence of the untiring efforts of the president and the program committee to provide a rich program appealing to

all classes of members of the Association and with a common purpose.

As usual the annual banquet afforded fun galore. The commercial men reserved a large section of the banquet tables and made merry with songs, balloon ascensions, personal jabs at the toastmaster and officers, roasts, etc., etc. In the midst of the festivities a number of newsboys startled everyone with their cries of "Extra, Extra!" and immediately everyone wanted an extra paper which told of the great array of wit and wisdom displayed at the banquet. The extravagant descriptions of some of the addresses served to reduce the egotism of the speakers.

Friday afternoon the visitors were given an automobile ride thru the parks and other beauty spots of the city. During the entire convention the Grand Rapids Teachers' Club served tea without charge to visitors in a booth in the exhibits. This service was sincerely appreciated by persons who had spent hours walking about among the exhibits.

A meeting of teachers of printing was held in Grand Rapids at the same time as the Drawing and Manual Training convention. Many members of the Association wished to attend the meeting of the printing teachers but in many instances the meetings were so arranged that it was impossible to attend both sessions. After a somewhat spirited discussion among the teachers of printing, it was voted to request the Association to organize a special round table for teachers of printing at the next meeting. As a similar request had been made to the Council, the round table was organized with Mr. W. L. Adams of the South High School of Grand Rapids as chairman and Henry Wagner of the Junior High School as secretary. The Council also authorized the officers of the printing round table to conduct an investigation of the status of printing in schools, the expense of the investigation to be met by the Association.

As is usually the case, the business meeting was a spirited session. The proposition to change the name of the organization to "Western Arts Association" met with decided opposition. After a prolonged discussion this matter was laid over for another year. A number of modifications to the constitution were proposed, among them the matter of dropping members from the list as soon as they become delinquent in their dues, in place of retaining them for an additional year.

The competition for the next meeting was also lively. Four cities were urging the convention to meet with them—St. Paul, Dayton, Toledo, and Lincoln, Neb. As the committee on place of meeting could not agree and failed to recommend a meeting place the matter was decided on the floor with the result that Lincoln, Neb., was chosen. The Nominating Committee nominated a ticket on which all of the officers were men, and without discussion the ticket was elected. It was then noticed that all of the officers elected are men and a motion to reconsider was defeated. This unfortunate action caused some ill-feeling among certain members, but when it became generally known that this had been unintentional, this feeling abated somewhat.

The officers elected are as follows:

President, E. J. Lake, head of Department of Art and Design, University of Illinois.

Vice-President, L. R. Abbott, Director of Manual Training, Grand Rapids.



Treasurer, L. W. Wahlstrom, Francis Parker School, Chicago.

Auditor, Harry E. Wood, Director of Manual Training, Indianapolis.

Member of Council, S. J. Vaughn, State Normal, De Kalb, Ill.

The report of the secretary showed the finances of the Association to be in a very satisfactory condition. As the earnings of the Exhibit Committee are now turned into the treasury, and there is a balance in the savings bank, the treasurer will have a balance on hand at the close of the meeting of approximately \$3,800. Of this \$800 will be spent for the publishing of the annual report of the meeting.

The Association unanimously passed a resolution expressing its gratitude to the citizens of Grand Rapids for the cordiality displayed in entertaining the convention, to L. R. Abbott for the excellent manner in which the exhibits were cared for, and to the members of the local committee for caring for the convention in such an unusually satisfactory manner.

Another resolution was passed endorsing the Smith-Hughes Bill now before Congress appropriating Federal funds for the support and promotion of Vocational Education.

A unique feature of the convention was the work of the boy-scouts. Whenever chairs were wanted or any shifting was to be done on the stage a group of uniformed boys was on hand to do the work. They watched the exhibits, ushered people about, checked coats and parcels, without expecting or accepting any tips. The gentlemanly conduct of the boys gave one a very high regard for the organization.

#### The Exhibits.

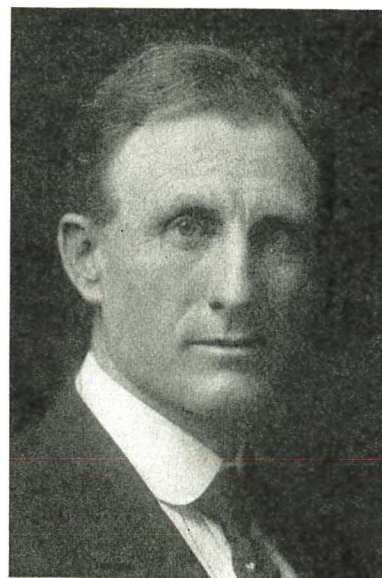
The following school exhibits were shown at the convention:

*Colleges and Normal Schools*—Chicago Academy of Fine Arts, Chicago Art Institute, Chicago School of Applied and Normal Art, Chicago Technical School, Cleveland School of Art, Iowa State College, Kalamazoo (Mich.) Normal, Marquette (Mich.) Normal, Milwaukee Downer, Minneapolis Handicraft Guild, Milwaukee (Wis.) Normal, Mt. Pleasant Normal, New York School of Fine and Applied Art, Ohio University, Pittsburgh University, Stout Institute, Warrensburg (Mo.) Normal, Ypsilanti (Mich.) Normal.

*Public Schools*—Akron, O.; Battle Creek, Mich.; Benton Harbor, Mich.; Calumet, Mich.; Fairfield, Ia.; Fort Wayne, Ind. (printing); Grand Forks, N. D.; Grand Rapids, Mich. (art and manual training); Grand Rapids, Mich. (printing); Indianapolis, Ind.; Kalamazoo, Mich. (art and manual training); Kansas City, Mo.; Moline, Ill.; Muskegon, Mich. (art, manual training and printing); Newark, N. J.; New York City; Oak Park, Ill.; Peoria, Ill.; Petoskey, Mich.; Pittsburgh, Pa. (printing); Pontiac, Ill.; Portland, Ore.; Pueblo, Colo.; Sioux Falls, S. D.; Toledo, O.; University City, Mo.

#### AN ART TEACHER'S REPLY.

In the May issue of the *Industrial-Arts Magazine* appeared a letter from a superintendent of schools outlining



PROF. EDWARD J. LAKE,  
President-elect Western Drawing and Manual  
Training Association, Champaign Ill.

qualities which he desired in an art teacher. A reply has reached the editors from a young woman. She writes:

To the Editors:

I am a teacher of Public School Art and I am interested in an A No. 1 position provided I can find what I want.

I have had ten years of experience as a supervisor and I have yet to find the place where I can carry out one-half the ideas I have for the correlation of art and the other subjects in the curriculum, manual training especially.

Most superintendents will not allow an art teacher to work separately with boys and girls so that if girls make pin cushions and boys make ironing boards and footstools the art teacher must either be neutral and ignore each, or she must make the girls design and draw the ironing boards and footstools and the boys must take their turn at sofa pillows and pin cushions.

Personally I have never learned anything that was entirely useless. Tho I am a woman I am proud of the fact that I can drive a nail or saw a board or make a half-lap joint, and I do not think any man need regret the fact that he can use a needle or that he knows cotton from silk or the difference between yeast and baking powder.

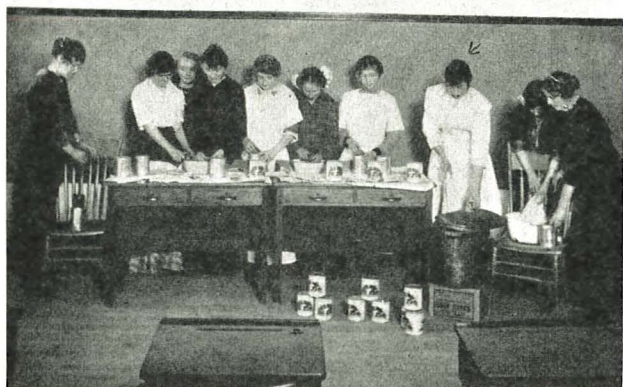
However, I realize that in this busy world boys must be boys and girls must be girls and I would be glad to work in a school system where the difficult problems of mixed classes in manual arts were removed.

I would also like to work in a school system where the superintendent really wanted to accomplish something in public school art for he would probably not expect to have an art teacher accomplish very much in *an hour a week* in seventh and eighth grades. I am tired of trying to get results while riding a galloping horse.

Then I would like to work under a superintendent who really wanted all these things for he would probably be willing to buy supplies liberally and not expect the supervisor to make bricks without straw.

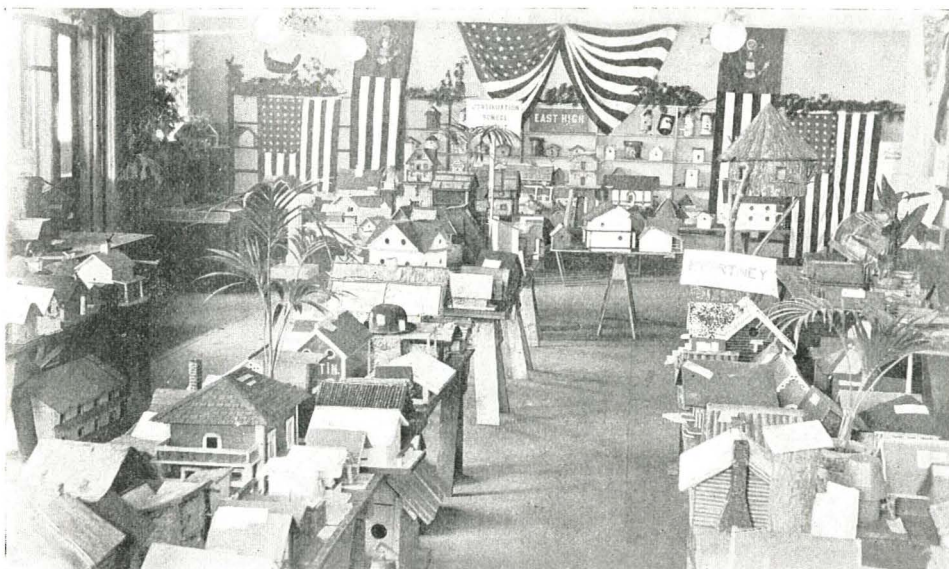
And then best of all, perhaps if this superintendent found an art teacher true to his ideal, who could and would do practical, sensible art work, he would be willing to cooperate with her and respect her judgment, and he would be willing to pay her what her services were worth to the community regardless of the number of years she had been in his system, not expecting to get superior service for inferior salary.

If there is such a position open for me in the Middle West, I would be only too glad to get busy on applications, letters of recommendation, photographs, physical examination, color of my hair, eyes and teeth, and the story of my life.



Canning Class in Rural School, Cook County, Ill.





GENERAL VIEW.

## BIRD HOUSE CONTEST IN GREEN BAY.

E. J. Waterman, Director of Industrial Arts, West High School.

The movement for holding bird house contests in the schools has grown remarkably, not only because it affords the manual training teacher a simple problem in woodworking, but because the people of our cities and rural districts are awakening to the necessity of doing something to save the birds. It was with this thought in mind that a successful bird house contest was conducted in March and April at Green Bay, Wis.

The contest originated in the West High School and spread immediately to the other three high schools and thirty graded schools of Green Bay County. The business houses and the local newspaper promoted the contest enthusiastically as soon as they heard of it.

The general public, as well as the boys in the woodworking classes of the several schools, were invited to take an interest in the contest. It was felt that the boys were not a problem, for every boy will enjoy the making of a bird house. It was rather the general public which must be educated to the idea that it is of vital importance to save our native birds and that a great deal can be accomplished by building proper houses and feeding boxes.

Five weeks were allowed for the contest. During this period lectures were given in each of the high and grade schools and in many local clubs and associations. The motion picture theaters ran motion pictures of birds and bird life and showed slides announcing the contest. The newspaper printed a series of illustrated articles on the following subjects: Houses for small birds, houses for large birds, feeding boxes, the placing of bird houses, the finishing of bird houses. In addition to these informational articles, news stories were printed each evening on birds. The interest was never allowed to diminish and when the lesson articles on the construction of the houses were completed, letters were printed on the bird house contest from persons who had expressed themselves on the necessity of saving birds. The art department of the West High School prepared a special poster telling of the value of saving birds and calling on the public to build houses. These posters were placed in many windows of stores, and in the city library.

An essay contest was also a part of the bird house contest. Prizes were offered for the best essay on the protection of birds from grade school pupils and from high school students.

The bird house is properly not a high school problem. However, the designing and making of a bird bath in concrete contains such elements and difficulties that it is well adapted for high school studies. In the contest this proved to be especially true. The high-school boys made baths

of concrete and sold them at \$6.50.

The majority of the bird houses made by the children were sold at prices varying from twenty cents to ten dollars. Ten per cent of the money realized from the sales was given to the children's department of the city library for the purchase of books.

Altho three prizes were originally offered, the final prize list grew to twenty-four articles. No cash prizes were offered because of the moral effect, but the articles which were given were chosen for their practical value. It is remarkable that no merchant of the city offered a prize as an advertisement of his wares. The list of prizes included banners, a camera, a ten-dollar box of tools, a box of drawing instruments, a box of chisels,

bits and a brace, a work bench, a grinder, a suit of clothes, lumber, magazine subscriptions, candy, a canary, books, a dictionary.

The contest brought out a large number of houses built by adults.

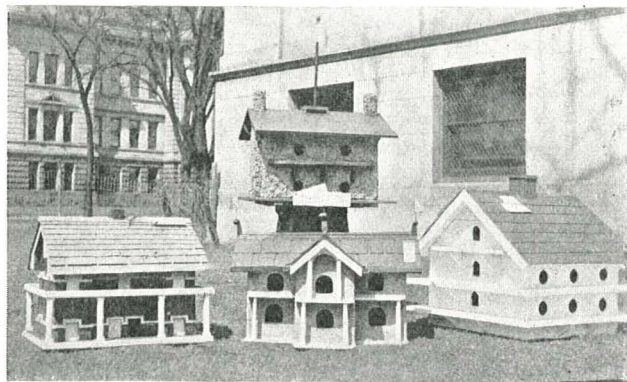
It is the writer's advice to manual training teachers that bird house contests be carefully planned and that they be studied not as mere diversions for classes in woodworking, but as a serious useful community project.

## A CORRECTION.

Thru a typographical error, a table in Mr. Rodgers' article on the Prevocational Courses at Menomonie, Wis., conveyed the idea that only two courses are offered each year in the grades and the first two years of the high school. In fact, four courses are offered.

The table should have read as follows:

Seventh grade	Bricklaying
Carpentry	Architectural Drawing
Plumbing	
Eighth Grade	Forging
Printing	Mechanical Drawing
Cabinetmaking	
First-Year High School	Joinery
Painting	Freehand Sketching
Woodturning	
Second-Year High School	Foundry
Machine Drawing	Machinshop
Patternmaking	
Third and Fourth-Year High School	
Electives	



PRIZE HOUSES—MARTINS.



# NEW BOOKS AND PAMPHLETS

## Occupations.

By E. B. Gowin and W. A. Wheatley. Svo, cloth, 357 pages, illustrated. Price, \$1.20. Ginn and Company, Boston, New York and Chicago.

This volume is intended as a textbook to be used in the first or second year of the high school. The course as planned can be completed in a half-year with daily recitations or in a full school year with recitations two or three times a week. The text provides for considerable freedom on the part of the teacher and the material is presented in such a manner that it must be localized.

Part I emphasizes the importance of a motive in life and the necessity of preparing for a vocation. It also describes a method of studying an occupation in order to determine its desirability as a vocation.

Part II describes in detail the work done in agriculture, commercial occupations, transportation, civil service, manufacturing, the building trades, machine and related trades, the engineering professions, and the learned professions. It also describes in general terms the requirements of some of the newer occupations, and the opportunities in them.

Part III is devoted to vocational adjustment and gives valuable suggestions as to methods of securing a position. This is followed by a list of helpful books on occupations.

There can be no doubt that there will be a large demand for such a book as a text in high schools and vocational schools.

## Art in Dress.

Lydia Bolmar and Kathleen McNutt. Paper, 46 pages; price, 35 cents. The Manual Arts Press, Peoria, Ill.

This book has been prepared to meet the needs of students in domestic arts classes in which the art instruction is limited to the very essentials of design and color as applied to dress, millinery, simple embroidery. Some notes on home decoration are added. The book is practical, clear and in keeping with the best present methods.

## School of Practical Electricity.

Book II. By O. Werwath. Cloth, 80 pages. Price, \$1. Electroforce Publishing Co., Milwaukee.

This book is the second volume of a complete series of textbooks on electricity for industrial schools. It takes up the theory of direct currents. The chapter headings are: Electric units and laws, series currents, multiple currents, electrical power, resistance, electro-heating. Ample problems and experiments are provided.

## Bird Houses Boys Can Build.

Albert F. Siepert. Paper, 60 pages. Price, 50 cents. The Manual Arts Press, Peoria, Ill.

The articles and illustrations printed recently in the Manual Arts Magazine, in connection with a bird house prize contest, have been here republished in attractive form.

## Geographical and Industrial Studies—Asia.

By Nellie B. Allen. 449 pages. Price, \$0.80. Ginn & Co., Boston.

This book aims to make the Far-Eastern continent of Asia mean more to the pupils in the grades than a collection of colored areas, numerous names or a maze of dots and lines would. The modern teacher, to hold the interest of her pupils, must deal with real people, industries and places.

The book discusses China, Japan, Persia, India, Siberia and other countries of Asia, and describes in an interesting manner, the transportation and travel facilities, the industries, natural resources, and the education, religion and home life of the people.

The book gives pupils in the grammar grades a broad knowledge of the countries beyond the Pacific and a better appreciation of the skill, industry and thrift of the people.

## Plane and Solid Geometry.

By Webster Wells and Walter W. Hart. Cloth, 467 pages. Price, \$1.30. D. C. Heath & Co., Boston, New York, Chicago.

Persons familiar with the Wells and Hart series of mathematical textbooks will need no introduction to this new work.

It is characterized by the same pedagogical insight and experience and same spirit of progress that have marked the previous texts. It is a thoro revision of Wells's *Essentials of Geometry* in accord with current scientific and pedagogical thought.

In each section of the book, the important theorems are given first and constitute a very satisfactory minimum course. These are followed by a series of theorems or applications which are for use as supplementary material.

The use of geometry in design and in industry is given considerable attention.

## Manual Training for Rural Schools.

By Louis M. Roehl. 45 pages, price, 25 cents. Bruce Publishing Company, Milwaukee, Wis.

This is intended as a textbook to be used by rural school pupils in manual training work. The problems are all practical projects in woodwork which can be made of available material with limited equipment, and which, when completed, can be used to advantage about the farm. The author has developed the problems in his experience in an agricultural school, and each problem has been constructed by boys in such a school.

The directions are very complete, giving the dimensions of each piece used and describing each process in its proper sequence. A list of equipment and its cost is given together with directions for the use of woodworking tools.

The material will prove of value to every teacher of farmer boys, especially to the teacher with little or no experience in the use of tools.

*Standard Density and Volumetric Tables.* Circular 19, United States Bureau of Standards, Washington, D. C. This is the fifth revised edition and will be found particularly helpful in the school laboratory. It contains tables for use in measurements of density and volume of such liquids as water, alcohol, sugar solutions, petroleum oils, etc., and special tables for use in the calibration of glass volumetric apparatus and hydrometers. In the new edition the tables have been rearranged and several new tables added. Copies of the publication will be sent free to persons interested upon application to the Bureau of Standards, Washington, D. C.

*The Ingol* is the title of a new monthly magazine prepared entirely by the printing department of the Washington Junior High School, Butte, Mont. The magazine measures 5½ by 8 inches and contains twenty pages and cover. It is fully illustrated.

*The Society for Electrical Development*, New York City, has announced a national poster competition which will be open to professional artists, art students and public school students thruout the country. The competition which has been undertaken by the society for a suitable design for use in a country wide celebration to be held in December, 1916, opened in April and will close June, 1916.

The competition will be in charge of a group of recognized authorities. Five prizes will be awarded. The grand prize will be \$1,000, the second \$500, the public choice \$300, the art student \$200 and the public school \$200.

Persons who plan to enter the competition should address the Poster Committee, Society for Electrical Development, 29 W. 39th Street, New York, for the rules governing the competition.

A *splendid spring meeting* was held by the Northwest Pennsylvania Arts Association on April 15th at Ridgeway. Fifty teachers of manual training, domestic science, music and drawing were present at the sessions which were in charge of Mr. Ray Diver of Erie.

Miss Katherine Signor and Miss Florence Phillips, respectively, spoke on "The State Convention at Scranton"; Mr. J. Broderic discussed "Organizing a Shop," and Mr. E. L. Bowman spoke on "What's in a Name?" There were round tables on domestic arts, drawing and music and manual arts.

The officers elected are: Chairman, Mr. Ray Diver; secretary-treasurer, Miss Laura E. DeForest. The next meeting will be held on November 6th at Warren, Pa.



## Now, Are There Any Questions?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. If an answer is desired by mail, a stamped envelope should be enclosed. Address, Industrial-Arts Magazine, Milwaukee, Wis.

### Book on Elementary Naval Architecture.

383. Q.—Have you anything on Elementary Naval Architecture for High Schools?—*L. C. H.*

A.—Perhaps some reader of the *Industrial-Arts Magazine* can suggest a suitable book. The Editors will be glad to receive titles.

### Perspective for Mechanical Drawing.

386. Q.—I should like to get a good clear book on perspective, for mechanical drawing classes, preferably one which deals with it alone. Can you name one?—*W. J. L.*

A.—The following books will be helpful:

*Perspective Sketching from Working Drawings.* F. E. Mathewson. \$1. Taylor Holden, Springfield, Mass.

*Simplified Mechanical Perspective.* F. E. Frederick. 75 cents. Manual Arts Press, Peoria.

*Perspective: An Elementary Textbook.* B. J. Lubsch. \$1.50. D. Van Nostrand Co., New York City.

*Mechanical Drawing and Practical Drafting.* Charles H. Sampson. \$1.50. Milton Bradley Co., Springfield, Mass.

*Sketches for Mechanical Drawing.* A. W. Smith. \$1. Pratt Institute, Brooklyn.

*Applied Mechanical Drawing.* Mathewson and Stewart. \$1. Taylor Holden Co., Springfield, Mass.

### Circassian Walnut Finish on Red Gum.

399. Q.—Will you kindly give me a formula for giving red gum a circassian walnut finish?—*W. J. B.*

A.—Make a weak water solution of walnut crystals. To this add a little black nigrosine which has been dissolved in water; add the nigrosine gradually until the desired shade is obtained. (The shade may be found by using a test piece.) Sand when dry, and follow with two coats of white shellac and two coats of varnish, rubbed to a dull finish.

Walnut crystals and nigrosine are two aniline dyes which may be difficult to obtain at this time. In this case, I would suggest that a weak solution of any brown stain (preferably water) be used and brought to the circassian shade of walnut with a black.

Nigrosine, or other black, is employed to add the narrow stripes to gum that are characteristic of the genuine circassian walnut. The striping is done by means of a small brush before the stain is applied.—*J. M. Dorrans.*

### Jewelry Making in Schools.

409. Q.—I want information about jewelry and jewelry making. Who teaches it and where? What books are out on this subject? What schools teach it, etc?—*A. G. P.*

A.—Jewelry is taught at Stout Institute, Menomonie, Wis.; Academy of Fine Arts, Madison St., Chicago; Normal School, DeKalb, Ill.; University of Illinois Summer School and in a large number of high schools.

*Handwrought Jewelry*, Sorensen and Vaughn, is now being published by The Bruce Publishing Company, Milwaukee, Wis.

### Finish for Laboratory Table Tops.

413. Q.—Will you kindly inform me what is the best preparation that will withstand acids, etc., to use in finishing a laboratory table top made of hard pine? Black finish desired.—*R. E. C.*

A.—The following formula is used by several universities:

#### Solution A.

Crystallized copper sulphate.....125 grams  
Potassium chlorate.....125 grams  
Distilled water.....1 liter  
Boil in porcelain or glass dish until both salts are dissolved.

#### Solution B.

Aniline oil.....125 cubic centimeters  
Conc. hydrochloric acid.....175 cubic centimeters  
Distilled water.....700 cubic centimeters

Clean the table of dirt or varnish down to the wood and apply with brush two coats of solution A, putting the second on as soon as the first one is dry. Put both on boiling hot. Now apply two coats of solution B and allow to dry thoroly. With a piece of cheese cloth apply a very thin coat of raw linseed oil. When thoroly dry, wash off excess of oil and stain with boiling hot soap suds. This treatment leaves the tables with a dull black finish which will resist acids and alkalies for years.

The following formula is used by Harvard University:

*First Coat.* 125 grains copper sulphate powder, 125 grains potassium chlorate, 1 liter of water. Heat in steam bath or double kettle in glass or porcelain vessel till dissolved. Apply one coat hot with clean brush.

*Second Coat.* 150 grains of aniline hydrochlorate, 1 liter of water. Dissolve same as above. Apply three coats with a clean brush, each coat to become thoroly dry before applying next. Color will become green when first applied, but in several days will turn a dead black. Allow material to thoroly dry and wipe bench tops with linseed oil. The above quantities will cover about 5 square yards.

### A List of School Superintendents.

414. Q.—I would like to have you tell me from whom I may obtain a list of school superintendents for the Pacific Coast States and Nevada and Arizona.—*F. J. B.*

A.—Lists of school superintendents may be obtained from the United States Bureau of Education, Washington, D. C.

Lists of special states such as you desire, may also be obtained from the respective state superintendents. Letters addressed to the following superintendents will receive careful attention:

Ariz.—C. O. Case, Phoenix.

Cal.—Edward Hyatt, Sacramento.

Colo.—Mrs. Mary C. C. Bradford, Denver.

Mont.—H. A. Davee, Helena.

Nev.—J. E. Bray, Carson City.

Ore.—J. A. Churchill, Salem.

Utah.—E. G. Gowans, Salt Lake.

Wash.—Mrs. Josephine Preston, Olympia.

Wyoming—Miss Edith K. O. Clark, Cheyenne.

Ida.—Miss Bernice McCoy, Boise.

### Industrial Motion Pictures.

415. Q.—Can you tell me where I can get stereopticon slides on Industrial Education?—*L. R. D.*

A.—Industrial motion pictures may be had from the following:

Pathescope Company of America, New York and Chicago.

Industrial Bureau, Washington, D. C.

Atlas Educational Film Co., 5 So. Wabash Ave., Chicago.

General Film Co., 200 Fifth Ave., New York City.

A special list of films has been prepared by Henry Disston & Sons, Philadelphia, Pa. Industrial slides of various kinds are prepared and sold by Underwood & Underwood, New York City, and by the McIntosh Stereopticon Co., Chicago.

### Art Glass for Lamp Shades.

416. Q.—Have you the address of a company selling art glass for lamp shades?—*H. E. F.*

A.—The following firms in Ohio sell art glass:

Anchor Art Glass Co., 421 Elm St., Cincinnati, O.

Whipple Art Glass Co., 409 Prospect Ave., Cleveland, O.

Dayton Art Glass Works, Dayton, Ohio.

Toledo Art Glass and Mirror Works, 416 S. St., Toledo, O.

Ohio Art Glass Co., Youngstown, O.

Von Gerichten Art Glass Co., 557 S. High St., Columbus, O.

### Books on Figure Drawing.

417. Q.—Do you publish any books on figure drawing?—*H. L.*

A.—Splendid lists of these books can be obtained by addressing the Prang Company, New York, John Lane Co., New York, or Brentano's Book Store, New York.

Two of the best books on Figure Drawing are: *The Human Figure*, by J. H. Vanderpoel, \$2. Inland Printer Co., New York, Chicago; *Figure Drawing*, by R. G. Hatton, \$2.95. Adam Budge, Book Agent, New York City.